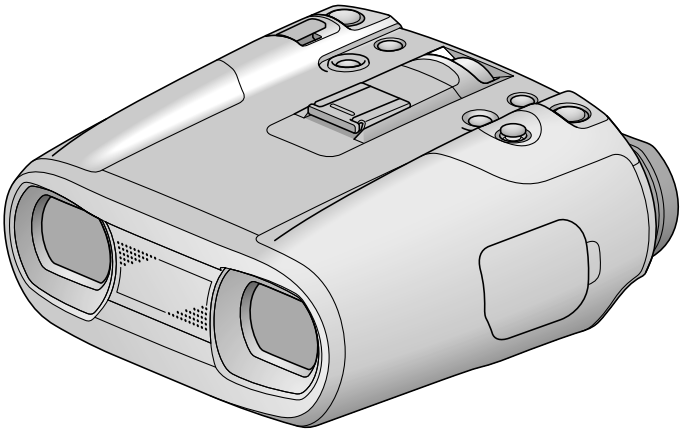
SONY

Digital Recording Binoculars Handbook

DEV-30/50/50V



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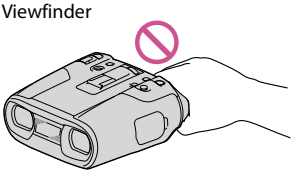
4-464-705-**12**(1)

Read this first

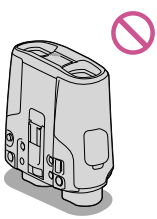
Using this product

- Do not hold this product by the following parts. Also, do not hold this product by the battery/ memory card cover or jack covers.

Viewfinder



- Do not place this product with the viewfinder facing down.



- This product is dustproof and rainproof. See “About dust & rain proof performance of this product” (p. 5).

Menu items, viewfinder, and lens

- A menu item that is grayed out is not available under the current recording or playback conditions.
- The viewfinder is manufactured using extremely high precision technology, so over 99.99% of the pixels are operational for effective use. However, there may be some tiny black points and/or bright points (white, red, blue, or green in color) that appear constantly in the viewfinder. These points are normal results of the manufacturing process and do not affect the recording in any way.
- Exposing the viewfinder or the lens to direct sunlight for long periods of time may cause malfunctions.
- Do not aim at the sun. Doing so might cause this product to malfunction. Take images of the sun only in low light conditions, such as at dusk.

About language setting

- The on-screen displays in each local language are used for illustrating the operating procedures. Change the screen language before using this product if necessary (p. 17).

On recording

- To ensure stable operation of the memory card, it is recommended that you format the memory card with this product before using it the first time (p. 58). Formatting the memory card will erase all the data stored on it and the data will be irrecoverable. Save your important data on your PC etc.
- Before starting to record, test the recording function to make sure the image and sound are recorded without any problems.
- Compensation for the contents of recordings cannot be provided, even if recording or playback is not possible due to a malfunction of this product, memory card, etc.
- TV color systems differ depending on the country/region. To view your recordings on a TV, set [60i/50i Sel] to the setting required in your country/region before recording (p. 15).
- Television programs, films, video tapes, and other materials may be copyrighted. Unauthorized recording of such materials may be contrary to the copyright laws.
- Use this product in accordance with local regulations.
- See page 17 for the memory card you can use with this product.

Notes on playing back

- You may not be able to play back images recorded on this product using other devices. Also, you may not be able to play back images recorded on other devices using this product.

DVD media recorded with high definition image quality

- DVD media recorded with high definition image quality can be played back with devices that are compatible with the AVCHD standard. You cannot play discs recorded with high definition image quality with DVD players/recorders as they are not compatible with the AVCHD format. If you insert a disc recorded with the AVCHD format (high definition image quality) into a DVD player/recorder, you may not be able to eject the disc.

Save all your recorded image data

- To prevent your image data from being lost, save all your recorded images on external media periodically. To save images on your computer, see page 35, and to save images on external devices, see page 39.
- The type of discs or media on which the images can be saved depend on the [REC Mode] selected when the images were recorded. Movies recorded with [60p Quality PS] ([50p Quality PS]) or [Highest Quality FX] can be saved on external media devices or on Blu-ray discs (p. 37, 40).

Notes on battery pack/AC Adaptor

- Be sure to remove the battery pack or the AC Adaptor after turning off this product.
- Disconnect the AC Adaptor from this product, holding both this product and the DC plug.

Note on the binoculars/battery pack temperature

- When the temperature of this product or battery pack becomes extremely high or extremely low, you may not be able to record or play back on this product due to the protection features of this product being activated in such situations. In this case, an indicator appears on the screen (p. 70).

When this product is connected to a computer or accessories

- Do not try to format the memory card of this product using a computer. If you do so, this product may not operate correctly.
- When connecting this product to another device with communication cables, be sure to insert the connector plug in the correct way. Pushing the plug forcibly into the terminal will damage the terminal and may result in a malfunction of this product.

If you cannot record/play back images, perform [Format]

- If you repeat recording/deleting images for a long time, fragmentation of data occurs on the memory card. Images cannot be saved or recorded. In such a case, save your images on some type of external media first, and then perform [Format] (p. 58).

Notes on optional accessories

- We recommend using genuine Sony accessories.
- Genuine Sony accessories may not be available in some countries/regions.

About this manual, illustrations and on-screen displays

- The example images used in this manual for illustration purposes are captured using a digital still camera, and therefore may appear different from images and screen indicators that actually appear on this product. And, the illustrations of this product and its screen indication are exaggerated or simplified for understandability.
- In this manual, the DVD disc recorded with high definition image quality is called AVCHD recording disc.
- Design and specifications of this product and accessories are subject to change without notice.

Viewing 3D video images

- Some people may experience discomfort (such as eye strain, fatigue, or nausea) while watching 3D video images.
  Sony recommends that all viewers take regular breaks while watching 3D video images. The length and frequency of necessary breaks will vary from person to person. You must decide what works best.
  If you experience any discomfort, you should stop watching the 3D video images until the discomfort ends; consult a doctor if necessary.
  You should also review the instruction manual of any other device or media used with this product.
  The vision of young children (especially those under six years old) is still under development. Consult your doctor (such as a pediatrician or eye doctor) before allowing young children to watch 3D video images.
  Adults should supervise young children to ensure they follow the recommendations listed above.

Notes on use

- Be careful of your surroundings when using this product. Especially, do not use this product while walking. Doing so may cause accidents or injury.
- Do not do any of the following. Otherwise, the memory card may be damaged, recorded images may be impossible to play back or may be lost, or other malfunctions could occur.
  – ejecting the memory card when the access lamp (p. 18) is lit or flashing
  – removing the battery pack or AC Adaptor from this product, or applying mechanical shock or vibration to this product when the (Movie)/ (Photo) lamps (p. 21) or the access lamp (p. 18) are lit or flashing
- When using the neck strap, do not carry this product on your back. Doing so may cause injury. And do not allow this product to knock against another object.

About manuals for this product

Two manuals have been prepared for this product, the “Operating Guide” and the “Digital Recording Binoculars Handbook (PDF).” The “Operating Guide” introduces basic operations and the “Digital Recording Binoculars Handbook (PDF)” explains details of functions.

Operating Guide

This manual introduces the basic operations of this product, such as recording and playback.

Digital Recording Binoculars Handbook (PDF)

This manual explains various operations, such as how to use the setting menu and how to save images on other devices.

About dust & rain proof performance of this product

The main unit of this product has been proven (by our performance test) to reach dust & rain proof performance requirements equivalent to IEC60529 IP54. Sudden rain or fugitive dust will not affect operation of this product.

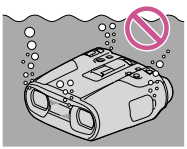
- Dustproof performance (IP5x): enclosure does not allow such ingress of dust as to cause harmful effects. The enclosure is not completely dust-tight, however, and is not guaranteed to protect against extreme dust exposure.
- Rainproof performance (IPx4): enclosure that does not allow splashing of water from any directions to cause harmful effects. This product is not protected against pressurized water, such as from a shower or tap, etc.
- When an accessory is attached or the AC adaptor or cables are connected, the dust & rain proof performance of this product may be compromised. Be careful not to allow dust or water to enter this product.
- Do not let the product come in contact with hot water or that with high mineral content.
- Strong shocks such as from dropping of this product may compromise the rain proof performance of this product. We recommended that you contact your Sony dealer or local authorized Sony service facility (charge applies) regarding repairs.
- Make sure to use this product properly, observing the following points, as damage caused by misuse, abuse or failure to properly maintain this product is not covered by warranty.

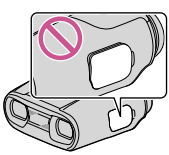
Do not use this product underwater.

This product is not waterproof, and should not be used underwater. Never immerse this product in water.

Securely close the battery/memory card cover or jack covers.

Water is more likely to enter this product if the cover is open. When using this product in the rain or with wet or sandy hands, do not open the battery/memory card cover or jack covers. Doing so may cause a malfunction.

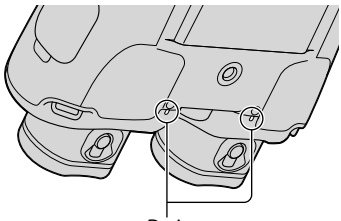




On use and care

- Sand, hair, dirt, etc., trapped in the sealing gasket of the battery/memory card cover or jack covers may lead to water entering this product. Wipe the area clean with a soft cloth that does not leave fibers.
- Scratches on and deformation or deterioration of the sealing gasket may lead to water entering this product. If the sealing gasket becomes scratched, deformed or deteriorated, consult your Sony dealer or local authorized Sony service facility.

- The drains on the bottom of this product are designed to allow any water or sand entering via the clearance of the IPD ADJ dial or the viewfinder to escape from the bottom.



- If sand caught in the parts of this product impairs their movement, remove the sand with a blower, etc., and then operate them repeatedly.

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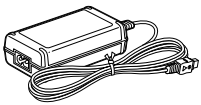
Step 1: Checking the supplied items

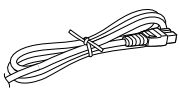
The numbers in ( ) are the supplied quantity.

Digital Recording Binoculars (1)

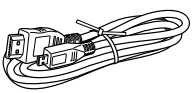
AC Adaptor (1)



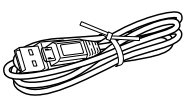
Power cord (Mains lead) (1)



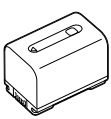
HDMI cable (1)



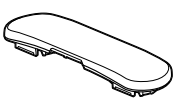
Micro USB cable (1)



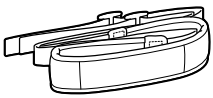
Rechargeable battery pack NP-FV70 (1)



Lens cap (1)



Neck strap (1)



"Operating Guide" (1)

CD-ROM "Manuals for Digital Recording Binoculars" (1)

– "Digital Recording Binoculars Handbook (PDF)"

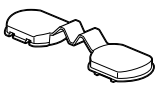
Notes

- The "PlayMemories Home" software and "PlayMemories Home Help Guide" can be downloaded from the Sony website (p. 36).

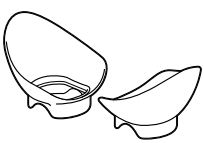
Only for DEV-50/50V

Carrying case (1)

Finder cap (1)



Large eyecup (2)

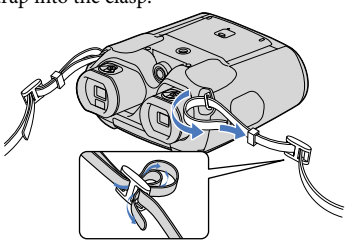


Attaching the supplied items

Attaching the neck strap

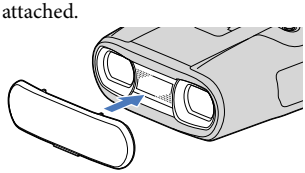
To avoid dropping this product, attach the neck strap to the binoculars following the steps below.

Insert one end of the neck strap into the strap mount on the binoculars. Then, fasten the neck strap, placing the end of the neck strap into the clasp.



Attaching the lens cap

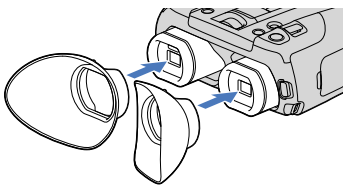
When you do not intend to use this product, store this product with the lens cap attached.



Attaching the large eyecup (DEV-50/50V)

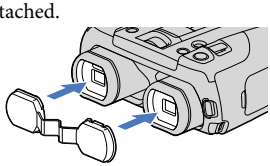
If you cannot see the picture in the viewfinder clearly under bright light, use the large eyecup.

Align the large eyecup with the eyecup groove in the viewfinder.

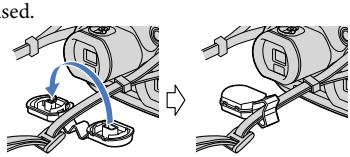


Attaching the finder cap (DEV-50/50V)

When you do not intend to use this product, store this product with the finder cap attached.



You can attach the finder cap to the neck strap as illustrated when it is not being used.



Step 2: Charging the battery pack

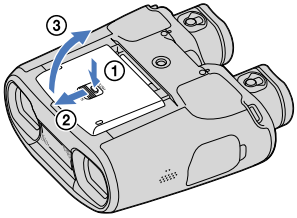
You can charge the “InfoLITHIUM” battery pack (V series).

Notes

- You cannot use any “InfoLITHIUM” battery pack other than NP-FV70/FV100 with this product.
- To charge the battery, turn off this product by pressing the POWER button.

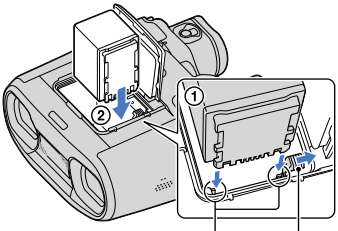
1

Press the battery/memory card cover button (①) and slide the cover in the direction of the arrow (②), then open the cover (③).



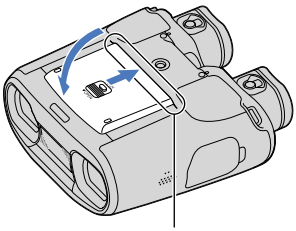
2

Align the battery with the grooves in the battery compartment while pressing the battery release lever (①), then slide the battery until it clicks (②).



3

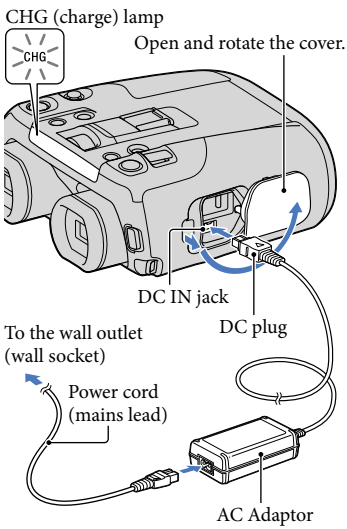
Close the battery/memory card cover.



Slide the cover until there is no gap.

4

Connect the AC Adaptor and the power cord (mains lead) to this product and the wall outlet (wall socket).



The CHG (charge) lamp lights up and charging starts. The CHG (charge) lamp turns off when the battery pack is fully charged.

5 When the battery is charged, disconnect the AC Adaptor from the DC IN jack of this product.

Charging time

Approximate time (min.) required when you fully charge a fully discharged battery pack.

Battery pack	Charging time
NP-FV70	195
NP-FV100	390

- The charging times shown in the table above are measured when charging this product at a temperature of 25 °C (77 °F). It is recommended that you charge the battery in a temperature range of 10 °C to 30 °C (50 °F to 86 °F).

Tips

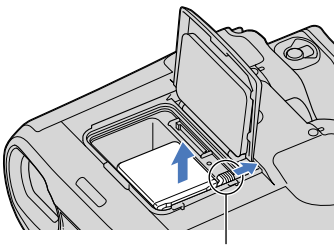
- See page 74 on recording and playing time.
- When this product is on, you can check the approximate amount of remaining battery power (expected recording and playing time) with the remaining battery indicator at the upper right on the screen.

To use a wall outlet (wall socket) as a power source

Make the same connections as “Step 2: Charging the battery pack” (p. 12). The battery pack will not be discharged even if left installed while using a wall outlet (wall socket) as a power source.

To remove the battery pack

① Turn off this product by pressing the POWER button.
② Open the battery/memory card cover (p. 12).
③ Slide the battery release lever and remove the battery.



Battery release lever

Charging the battery pack abroad

You can charge the battery pack in any countries/regions using the AC Adaptor (supplied) within the AC 100 V - 240 V, 50 Hz/60 Hz range.

Notes

- Do not use an electronic voltage transformer.

Notes on the battery pack

- When you remove the battery pack or disconnect the AC Adaptor, turn this product off and make sure that the (Movie)/ (Photo) lamps (p. 21), the access lamp (p. 18) are turned off.
- The CHG (charge) lamp flashes during charging under the following conditions:
  – The battery pack is not installed correctly.
  – The battery pack is damaged.
  – The temperature of the battery pack is low. Remove the battery pack from this product and put it in a warm place.
  – The temperature of the battery pack is high. Remove the battery pack from this product and put it in a cool place.

Notes on the AC Adaptor

- Use the nearby wall outlet (wall socket) when using the AC Adaptor. Disconnect the AC Adaptor from the wall outlet (wall socket) immediately if any malfunction occurs while using this product.

- Do not use the AC Adaptor placed in a narrow space, such as between a wall and furniture.
- Do not short-circuit the DC plug of the AC Adaptor or battery terminal with any metallic objects. This may cause a malfunction.

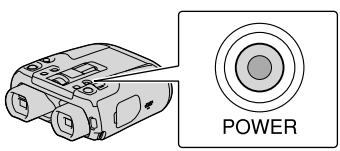
Step 3: Turning the power on, and setting up this product

Notes

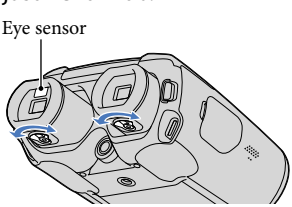
- Do not turn the power on with the micro USB cable connected.
- Do not connect the micro USB cable until the following procedure is completed.
- If this product is used by more than one person, adjust the diopter and the width whenever a different person uses it.

1 Press the POWER button.

This product is turned on.

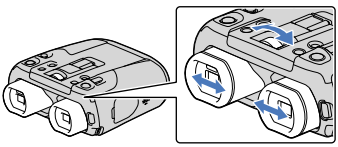


2 Adjust the diopter until you can see a clear image with each eye by turning the diopter adjustment knob.



- Adjust the diopter for each eye separately.
- If you bring your eyes close to the viewfinder, the eye sensor reacts to display the viewfinder screen.

3 Adjust the width between the left and right viewfinder to fit your eyes using the IPD ADJ dial.

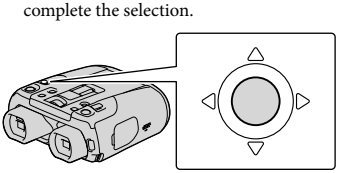


- Adjust the width so that left and right images overlap.
- Make sure that the image in the viewfinder does not appear as a double image.
- When the viewfinder exceeds the limit of the adjustable range, you will hear a click. The viewfinder will not move any further.

4 Set the language, area, summer time, date & time format, and date & time using the multi-selector, then confirm each setting.

Using the multi-selector

- Move the multi-selector towards ▲/▼/◀/▶ to select the desired item, and then press the center of the selector to complete the selection.



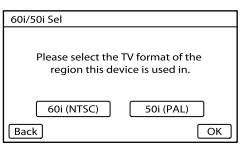
When each setting have been completed, select [Next].

- To set the date and time again, select MENU (MENU) → [Setup] → [Clock Settings] → [Date & Time Setting] → [Date & Time]. When [Date & Time] is not on the screen, press ▼/▲ until the item appears.

5 Select [60i (NTSC)] or [50i (PAL)] to suit the TV color system used in your country/region, then select OK.

When the 60i/50i selection is made, this product restarts to update the system.

- See page 77 for details on the TV color system in your country/region.



6 Adjust the relative vertical position of the right and left viewfinder.

Make sure that the horizontal line overlaps the vertical lines.

Image in the left viewfinder

Image in the right viewfinder

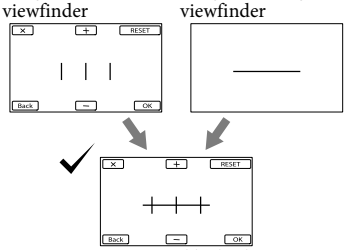
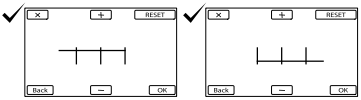


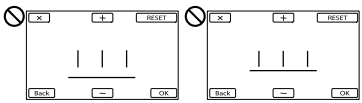
Image viewed by both eyes

If the horizontal line and the vertical lines do not overlap, adjust the position of the image in the right viewfinder by selecting + / − until the lines overlap, then select OK.

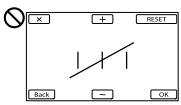
• If you see the image below, the device works correctly.



• If you see the image below even after adjusting the viewfinder, cease using this product.



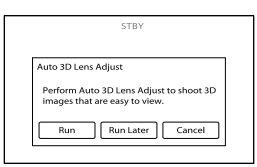
The horizontal line and the vertical lines do not overlap.



The horizontal line is extremely tilted.

If you cannot see images correctly, this product may be damaged. Contact your Sony dealer or local authorized Sony service facility.

7 Select [Run].

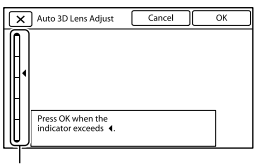


• If you select [Run Later], the recording mode screen appears. When you turn on this product next time, the [Auto 3D Lens Adjust] screen will appear.

8 Adjust the 3D lens.

Aim this product at a subject to display it on the screen.

• View a subject for which the scale of the indicator exceeds the ◀ mark, and then select OK.



Scale

• Do not change the subject until the adjustment is completed.

Notes

• If this product fails to perform [Auto 3D Lens Adjust], select [Run Again].

Type of subjects that should be displayed on the screen for [Auto 3D Lens Adjust]

The scale indicated varies depending on the subject displayed on the screen.

Subjects that indicate a higher scale:

– Distant subjects in bright places such as outdoors
– Subjects farther away than 20 m (65 ft.) from this product
– Subjects with various colors and shapes

Subjects that indicate a lower scale and result in adjustment failure:

– Subjects in night scenes and in dark places
– Subjects within 20 m (65 ft.) from this product
– Subjects with few patterns and shapes
– Subjects that repeat the same pattern, such as rows of windows on buildings
– Moving subjects

Notes

- The date and time does not appear during recording, but they are automatically recorded on the memory card, and can be displayed during playback. To display the date and time, select MENU (MENU) → [Setup] → [▶ Playback Settings] → [Data Code] → [Date/Time] → OK.

To turn off the power

Press the POWER button.

Changing the language setting

You can change the on-screen displays to show messages in a specified language. Select MENU (MENU) → [Setup] → [🔧 General Settings] → [Language Setting] → a desired language → OK.

Step 4: Inserting a memory card

Types of memory card you can use with this product

– "Memory Stick PRO Duo" media (Mark2) – "Memory Stick PRO-HG Duo" media	Described in this manual, "Memory Stick PRO Duo" media
– "Memory Stick XC-HG Duo" media	Described in this manual, "Memory Stick XC-HG Duo" media
– SD memory card – SDHC memory card – SDXC memory card	Described in this manual, SD card SD Speed Class 4 or faster is required.

- Operation with all memory cards is not assured.
- "Memory Stick PRO Duo" media of up to 32 GB, "Memory Stick XC-HG Duo" media of up to 64 GB and SD cards of up to 64 GB have been verified to operate with this product.

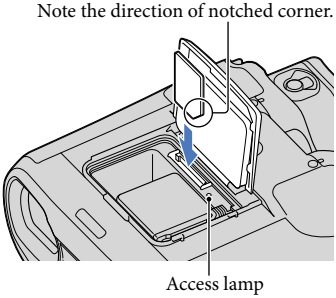
Notes

- Movies recorded on "Memory Stick XC-HG Duo" media and SDXC memory cards cannot be imported to or played back on computers or AV devices not supporting the exFAT* file system by connecting this product to these devices with the USB cable. Confirm in advance that the connecting equipment is supporting the exFAT system. If you connect an equipment not supporting the exFAT system and the format screen appears, do not perform the format. All the data recorded will be lost.

  * The exFAT is a file system that is used for the "Memory Stick XC-HG Duo" media and SDXC memory cards.

1 Open the battery/memory card cover (p. 12), and insert the memory card with the nothched edge in the direction as illustrated until it clicks.

Note the direction of notched corner.



Access lamp

If the [Preparing image database file. Please wait.] screen is displayed, wait until the screen disappears.

2 Close the battery/memory card cover (p. 12).

Notes

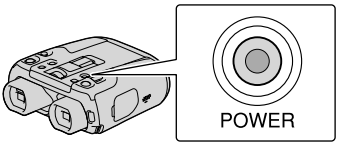
- If [Failed to create a new Image Database File. It may be possible that there is not enough free space.] is displayed, format the memory card (p. 58).
- Confirm the direction of the memory card. If you forcibly insert the memory card in the wrong direction, the memory card, memory card slot, and/or image data may be damaged.
- Do not open the battery/memory card cover during recording.
- When inserting or ejecting the memory card, be careful so that the memory card does not pop out and drop.
- Do not eject the memory card while the access lamp is lit. Doing so may cause movies and/or photos to not be saved on the memory card properly.

To eject the memory card

Open the battery/memory card cover and lightly push the memory card in once.

Using this product as binoculars

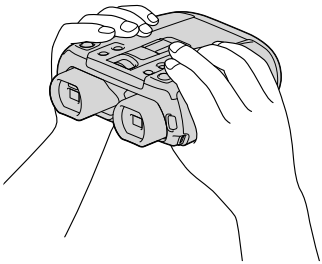
1 Press the POWER button.



This product is turned on.
Some settings screen may appear depending on the status of this product when it is turned on. Use this product after completing any necessary adjustments.

2 Make sure that the diopter, the width, and the relative vertical position of the right and left viewfinder fit you (p. 14).

3 Hold this product with both hands and aim it at the subject.



- You can magnify images with the power zoom lever.
- This product adjusts the focus automatically with the auto-focus function (default setting).

Tips

- [SteadyShot] is set to [Active] in the default setting.

About zooming

Magnifications available are as follows.

Binoculars magnification (approx.)

	DEV-30	DEV-50/50V
Movie recording (2D mode)*1	0.8 × to 15 ×*2 0.8 × to 10 ×*3	0.8 × to 25 ×*2 0.8 × to 12 ×*3
Movie recording (3D mode)*1	0.5 × to 6 ×	0.5 × to 6 ×
Photo recording	0.5 × to 15 ×*4	0.5 × to 25 ×*4

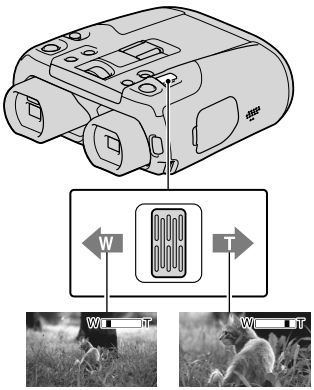
Zoom ratio (approx.)

	DEV-30	DEV-50/50V
Movie recording (2D mode)	20 ×*2 13 ×*3	33 ×*2 16 ×*3
Movie recording (3D mode)	12 ×	12 ×
Photo recording	33 ×*4	55 ×*4

*1 [SteadyShot] is set to something other than [Active]
*2 [Digital Zoom] is set to [On] (The image quality decreases when you use the large magnification)
*3 [Digital Zoom] is set to [Off]
*4 The image quality decreases when you use the large magnification

Tips

- The binoculars magnification indicates how big the subject looks with the binoculars compared with your naked eye.
- The zoom ratio indicates the ratio of the focal lengths between the minimum and maximum value.



Wider range of view (Wide angle)

Close view (Telephoto)

Move the power zoom lever slightly for a slower zoom. Move it further for a faster zoom.

Notes

- Be sure to keep your finger on the power zoom lever. If you move your finger off the power zoom lever, the operation sound of the power zoom lever may also be recorded.

To adjust the focus manually

① Select MENU (MENU) → [Camera/Mic] → [Manual Settings] → [Focus] using the multi-selector.

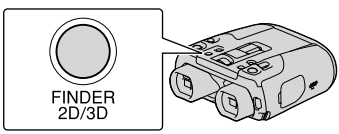
② Select [Manual], then select (nearby subject) / (distant subject) several times to adjust the focus.

Tips

- To adjust the focus automatically, select [Auto].

To switch the viewfinder display between 2D and 3D

Press FINDER 2D/3D to switch the viewfinder display between 2D and 3D. At the default setting, images in the viewfinder are displayed in 3D.



Notes

- The recorded image does not change even if you press FINDER 2D/3D.

Tips

- In the 3D display mode for the viewfinder, this product displays the image from the left lens in the left viewfinder, and the image from the right lens in the right viewfinder. In the 2D display mode, this product displays the image from the left lens in both the left and right viewfinder.

To use this product in dark places (Hyper Gain)

You can view a subject brightly even in dark places by increasing the gain.

Select MENU (MENU) → [Camera/Mic] → [Manual Settings] → [Hyper Gain] → [On].

Notes

- The image quality deteriorates due to noise when using [Hyper Gain]. In addition, the color of the image becomes light.

Tips

- It is recommended that you adjust the focus manually.

Recording

In the default setting, images in the viewfinder are displayed in 3D (p. 20), but movies are recorded in 2D.

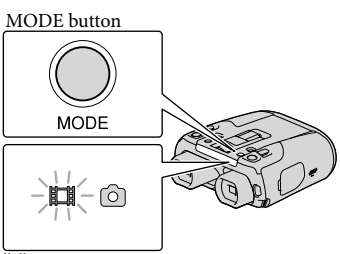
Press the POWER button.

This product is turned on.

Recording movies

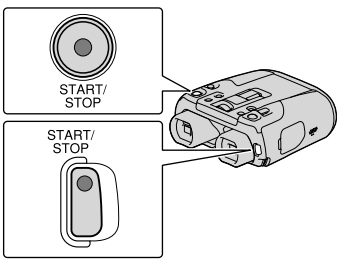
1 Make sure that the (Movie) lamp is on.

If the (Photo) lamp is on, press MODE to turn on the (Movie) lamp.

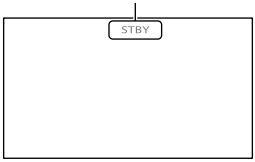


(Movie): When recording a movie
(Photo): When recording a photo

2 Press START/STOP to start recording.



[STBY] → [REC]



The recording lamp lights in red during recording.
To stop recording, press START/STOP again.

To display items on the screen again

Operate the multi-selector. You can change the settings using the [Display Setting] menu (p. 55).

Notes

- The maximum continuous recordable time of a movie is as follows.
  – 2D: about 13 hours
  – 3D: about 6 hours 30 minutes
- It will take several seconds until you can start recording after you turn on this product. You cannot operate this product during this time.

- The following states will be indicated if data is still being written onto the memory card after recording has finished. During this time, do not apply shock or vibration to this product, or remove the battery or AC Adaptor.
  – Access lamp (p. 18) is lit or flashing
  – The media icon in the upper right of the screen is flashing

Tips

- See page 75 on the recordable time of movies.
- You can check the recordable time, estimated remaining capacity, etc., by selecting MENU (MENU) → [Setup] → [Media Settings] → [Media Info].

To switch the 2D and 3D recording mode

You can select a recording mode of either 2D or 3D.

To switch 2D and 3D, select MENU (MENU) → [Image Quality/Size] → [2D/3D Mode Select].

Tips

- When you change the [2D/3D Mode Select] setting, movies played back on this product and movies output from the HDMI OUT jack are changed between 2D and 3D automatically.

Recommended distance from the subject and zooming level

The distance at which you can obtain good 3D movies varies depending on the zooming level.

Recommended recording distance (approx.)	Zoom
2 m to (9 m) [6 ft. to (30 ft.)]	W T
6 m to (16 m) [20 ft. to (51 ft.)]	W T
24 m to (30 m) [78 ft. to (100 ft.)]	W T

- A subject farther away than the recommended recording distance will lose 3D depth.

Notes

- You should not record a subject closer than the recommended recording distance in 3D because an uncomfortable movie will be recorded. Record the subject in 2D.
- When you record 3D movies, the binocular magnification can be set to up to about 6 ×. If you want to view or record a subject at greater magnification, set [2D/3D Mode Select] to [2D].

Data code during recording

The recording date, time, condition and coordinates (DEV-50V) are recorded automatically on the memory card. They are not displayed during recording. However, you can check them as [Data Code] during playback (p. 58).

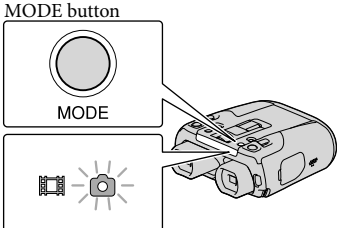
Shooting photos

1 Press MODE to turn on the (Photo) lamp.

The screen display switches for photo recording mode.

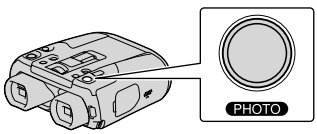
You can also switch the recording mode by selecting [MODE] on the viewfinder screen.

MODE button

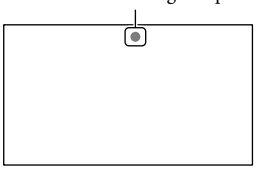


(Movie): When recording a movie
(Photo): When recording a photo

2 Press PHOTO lightly to adjust the focus, then press it fully.



Flashes → Lights up



When |||||||| disappears, the photo is recorded.

Note

- You cannot shoot photos when [2D/3D Mode Select] is set to [3D]. Select MENU (MENU) → [Image Quality/Size] → [2D/3D Mode Select] → [2D].
- You cannot shoot photos in 3D.

Tips

- See page 75 regarding the number of photos recordable.
- To change the image size, Select MENU (MENU) → [Image Quality/Size] → [Image Size] → a desired setting → OK.
- You cannot record photos while is displayed.

Playback on this product

You can play back images recorded with this product.

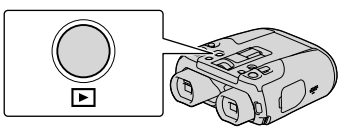
Tips

- If you want to play back 3D images, set [2D/3D Mode Select] to [3D].

1 Press the POWER button.

This product is turned on.

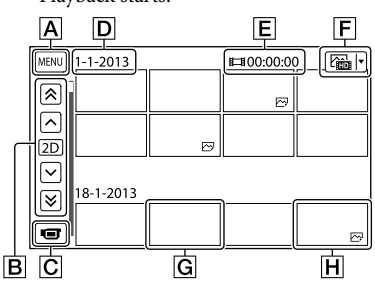
2 Press (View Images).



The Event Index screen appears after some seconds.

3 Select an image you want to view using the multi-selector, then press the center of the selector.

Playback starts.



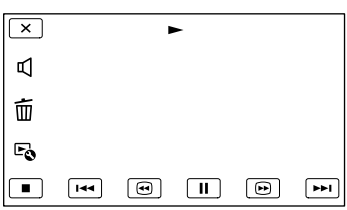
A To the MENU screen
B previous image / next image previous event / next event
C Change to the movie/photo recording mode

D Event title
E Total time of movies/Total number of photos in the event
F Switch Image Type button (2D only) (MOVIE, PHOTO, MOVIE/PHOTO*)
G Movie
H Photo

* If you start playback from the [MOVIE/PHOTO] screen, movies and photos are played back in the mixed order by shooting date and time.

- This product organizes images into a group that is called an event, based on the date and time, and information on how often you record images.

Operations available on the playback display



/	Pause/Play
	Stop
/	Previous/Next image
/	Fast-reverse/Fast-forward
	Play slide show
	Volume
	Delete
	Context

- Some buttons may not be displayed depending on the playback image.

Notes

- You may not be able to play back the images with devices other than this product.

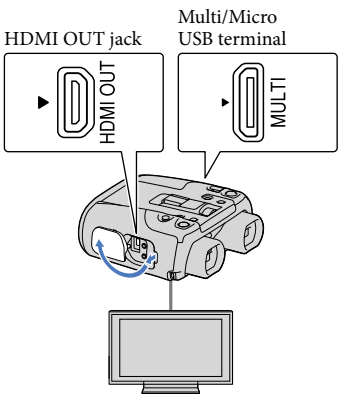
Tips

- When playback from the selected image reaches the last image, the screen returns to the INDEX screen.
- Select / during pause to play back movies slowly.
- As you repeat pressing Enter after selecting / during playback, movies are played as fast as about 5 times → about 10 times → about 30 times → about 60 times.
- The recording date, time, and shooting conditions are recorded automatically during recording. This information is not displayed during recording, but you can display it during playback by selecting MENU (MENU) → [Setup] → [Playback Settings] → [Data Code] → a desired setting → OK.
- To play a Slideshow, select [PHOTO] from the Switch Image Type button on the Event Index screen. To repeat Slideshow, select → [Slideshow Set].

Playing images on a TV

Connection methods, the image type (3D or 2D) and the image quality (high definition or standard definition) viewed on the TV screen differ depending on what type of TV is connected, and the connectors used.

Output connectors on this product



1 Switch the input on the TV to the connected jack.

- Refer to the instruction manuals of the TV.

2 Connect this product to a TV.

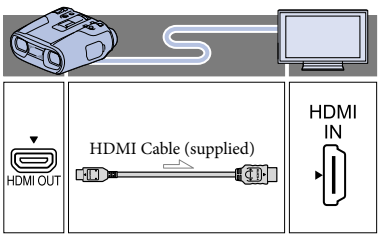
- Use the supplied AC Adaptor as the power source (p. 13).

3 Play a movie or a photo on this product (p. 23).

List of connection

Connecting to a 3D TV

Movies recorded in 3D are played back in 3D. Make sure that [2D/3D Mode Select] is set to [3D].



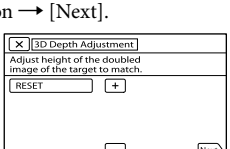
Adjusting the depth of 3D movies when this product is connected to a 3D TV with the HDMI cable (supplied)

You can adjust the depth of image while playing back 3D movies.

Only operating buttons are displayed in the viewfinder. Adjust the depth while checking the images displayed on the TV screen.

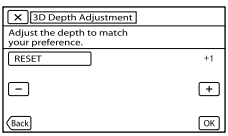
① Select → [3D Depth Adjustment] on the 3D movie playback screen.
The movie stops, and a warning about [3D Depth Adjustment] appears.
Select [Next] to display the screen used to adjust the vertical direction.

② Select [+] / [−] to adjust the vertical direction → [Next].



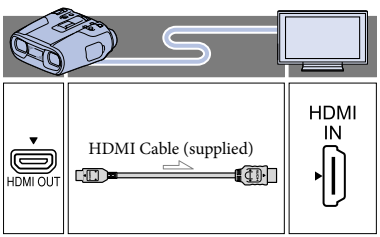
The screen used to adjust horizontal direction appears.

③ Select + / − to adjust the horizontal direction → OK.



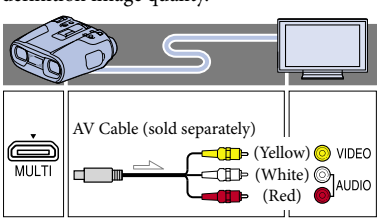
Connecting to a high definition TV

The movies are played back in high definition image quality.



Connecting to a non-high-definition 16:9 (wide) or 4:3 TV

Movies are played back in standard definition image quality.



When you connect with HDMI cable

- It is recommended that you use an authorized cable with HDMI logo or a Sony HDMI cable.
- Use an HDMI micro connector on one end (for this product), and a plug suitable for connecting your TV on the other end.
- Copyright-protected images are not output from the HDMI OUT jack of this product.
- Some TVs may not function correctly (e.g., no sound or image) with this connection.
- Do not connect this product HDMI OUT jack to an external device HDMI OUT jack, as malfunction may occur.

To set the aspect ratio according to the connected TV (16:9/4:3)

- Set [TV Type] to [16:9] or [4:3] according to your TV (p. 59).

When your TV is monaural (When your TV has only one audio input jack)

- Connect the yellow plug of an AV Cable (sold separately) to the video input jack and connect the white (left channel) or red (right channel) plug to the audio input jack of your TV or VCR.

When connecting to your TV via a VCR

- Connect this product to the LINE IN input on the VCR using an AV Cable (sold separately). Set the input selector on the VCR to LINE (VIDEO 1, VIDEO 2, etc.).

Notes

- When an AV Cable (sold separately) is used to output movies, movies are output with standard definition image quality.

Tips

- If you connect this product to the TV using more than one type of cable to output images, HDMI output takes priority.
- HDMI (High Definition Multimedia Interface) is an interface to send both video/audio signals. The HDMI OUT jack outputs high quality images and digital audio.

Using "BRAVIA" Sync

You can operate this product with the remote commander of your TV by connecting this product to a "BRAVIA" Sync compatible TV launched in 2008 or later with the HDMI cable.
You can operate the menu of this product by pressing the SYNC MENU button of the remote commander of your TV. You can display this product screens such as Event Index, play selected movies or display selected photos by pressing up/down/left/right/enter buttons of the remote commander of your TV.

Notes

- There may be some operations you cannot do with the remote commander.
- To set this product, select MENU (MENU) → [Setup] → [Connection] → [CTRL FOR HDMI] → [On] (the default setting) → OK.
- Also set your TV accordingly. Refer to the instruction manual of the TV for details.
- The operation of "BRAVIA" Sync differs according to each model of BRAVIA. Refer to the instruction manual of your TV for details.

Tips

- If you turn off the TV, this product will be turned off simultaneously.

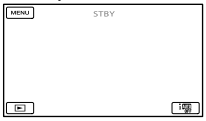
Useful functions for recording movies and photos

The available menu items differ between the movie mode (🎞) and photo mode (📷).

Recording better images automatically (Intelligent Auto)

When the Intelligent Auto function sets to [On] ([Off] is the default setting), you can record with the most suitable setting by detecting the scene automatically.

1 Select [iAUTO OFF] at the right bottom on the recording screen of movies or photos.



2 Select [On] → [OK].

Face detection

(Portrait), (Baby)

Scene detection

(Backlight), (Landscape), (Night scene), (Spotlight), (Low light), (Macro)

Camera-shake detection

(Walk), (Tripod)

Sound detection

(Auto Wind NR)

- To cancel the Intelligent Auto function, select [iAUTO] → [Off].

Notes

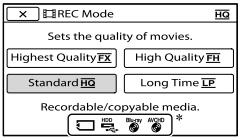
- This product may not detect the expected scene or subject, depending on the recording conditions.

Selecting the recording mode

You can switch the recording mode to select the movie quality ([Standard HQ] is the default setting). The recording time of the memory card is changed depending on the recording mode.
You cannot change the recording mode while recording 3D movies.

1 Select [MENU] (MENU) → [Image Quality/Size] → [🎞 REC Mode].

2 Select the desired recording mode.



The recording modes available will depend on the selected [🎞 Frame Rate] (p. 56).

* ⃠ appears on a medium icon if a movie recorded with the selected recording mode cannot be saved on the medium in use.

3 Select [OK].

Recording modes and the media

Types of media that images can be saved on will depend on the recording mode selected.

For details on a save operation using the external devices, see page 39.

Types of media	Recording mode			
	3D	PS*	FX	FH/ HQ/ LP
External media (USB storage devices)	✓	✓	✓	✓
Blu-ray discs	✓	✓	✓	✓
AVCHD recording discs	—	—	—	✓

* [PS] can be set only when [Frame Rate] is set to [60p] ([50p]) (p. 56).

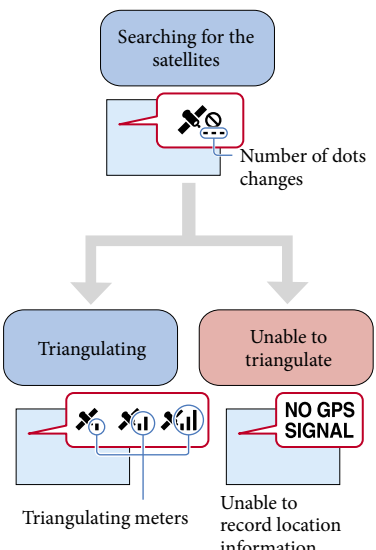
Tips

- This product can record images with the following recording format. The recording format varies depending on the setting of [60i/50i Sel].
  When [60i/50i Sel] is set to [60i (NTSC)]
  – 3D: 1920 × 1080/60i
  – PS: 1920 × 1080/60p
  – FX or FH: 1920 × 1080/60i
  – HQ or LP: 1440 × 1080/60i
  When [60i/50i Sel] is set to [50i (PAL)]
  – 3D: 1920 × 1080/50i
  – PS: 1920 × 1080/50p
  – FX or FH: 1920 × 1080/50i
  – HQ or LP: 1440 × 1080/50i
- You can select the following recording mode.
  – [3D] (MVC HD 28M (3D))
  – [60p Quality PS] ([50p Quality PS]) (AVC HD 28M (PS))
  – [Highest Quality FX] (AVC HD 24M (FX))
  – [High Quality FH] (AVC HD 17M (FH))
  – [Standard HQ] (AVC HD 9M (HQ))
  – [Long Time LP] (AVC HD 5M (LP))
- "M," such as in "24M," means "Mbps."

Recording information on your location (GPS) (DEV-50V)

This product records information on the location when movies or photos are recorded (the default setting).

GPS triangulating status



Notes

- It may take a while before this product starts triangulating.
- If this product cannot triangulate, the following operations may resolve the issue.
  – Move to a place where radio signals are easier to receive (p. 79).

Tips

- In the following situations, the current location of this product may be different from the actual location. The margin of error can be as wide as several hundred meters.

– When this product receives GPS signals that have been reflected off surrounding buildings.
– When the GPS signal is too weak.

- To display recorded location information, perform MENU (MENU) → [Setup] → [Playback Settings] → [Data Code] → [Coordinates].

To give priority to receiving GPS information

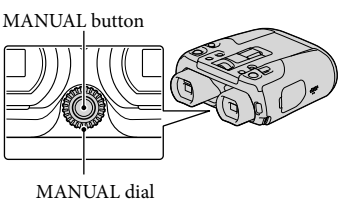
Use [GPS Information] (p. 61).

If you do not want to record location information

Perform MENU (MENU) → [Setup] → [General Settings] → [GPS Setting] → [Off].

Controlling the image settings manually with the MANUAL dial

You can assign 1 menu item you use often to the MANUAL dial.
The operation below is described as adjusting the 3D depth using the MANUAL dial that [3D Depth Adjustment] is assigned to. The [3D Depth Adjustment] here allows you to adjust the 3-dimensional appearance of the image on the screen during recording.



1 Press MANUAL to make this product adjust the depth of the 3D image.

Pressing MANUAL repeatedly toggles between enabling and disabling the 3D depth adjustment.

2 Rotate the MANUAL dial to adjust the 3D depth while checking the image on the screen.

Items you can control with the MANUAL dial

Movie recording

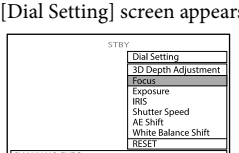
- [3D Depth Adjustment]
- [Focus] ... p. 49
- [Exposure] ... p. 49
- [AE Shift] ... p. 50
- [White Balance Shift] ... p. 50

Photo recording

- [Focus] ... p. 49
- [Exposure] ... p. 49
- [IRIS] ... p. 50
- [Shutter Speed] ... p. 50
- [AE Shift] ... p. 50
- [White Balance Shift] ... p. 50

To assign the menu item to the MANUAL dial

① Press and hold MANUAL down for a few seconds.
The [Dial Setting] screen appears.



② Rotate the MANUAL dial and select the item to be assigned.
③ Press MANUAL.

Notes

- Manual settings will be retained even if you change the assigned item of the MANUAL dial. However, if you set [Exposure] after setting [AE Shift] manually, [Exposure] will override [AE Shift].
- If you set either one of [Exposure], [IRIS], or [Shutter Speed], the settings of other 2 items are canceled.
- If you select [RESET] in step ②, all the items adjusted manually are reset to the default settings.

Tips

- With items other than [3D Depth Adjustment], pressing MANUAL switches between automatic and manual settings.
- You can also assign menu items to the MANUAL dial by selecting MENU (MENU) → [Camera/Mic] → [Camera Settings] → [Dial Setting].
- Even if you open the IRIS wider (a smaller F-stop) than F3.4 when you set the zoom lever to the W (Wide angle) side, the IRIS is reset to F3.4 as you move the zoom lever to the T (Telephoto) side.
- If you adjust the IRIS, the in-focus range in front of and behind the focused subject is changed. When you open the IRIS wider (a smaller F-stop), the in-focus range becomes narrower, and when you close the IRIS narrower (a larger F-stop), the in-focus range becomes wider. You can set the IRIS to a preferred value depending on the shooting scenes (p. 50).
- When you record images under a fluorescent lamp, sodium lamp, or mercury lamp, horizontal stripes may appear, flicker may occur, or color may change. In this case, change the shutter speed according to the power supply frequency in your region (p. 50).
- The camera data (p. 59) that appears on the screen will differ, depending on the recording settings of this product. The settings will be displayed with the following icons.
  – AUTO: Automatic
  – MANUAL: Exposure is set manually.

Editing on this product

Deleting images

You can free memory card space by deleting movies and photos from memory card.

Notes

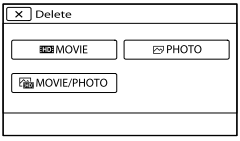
- You cannot restore images once they are deleted. Save important movies and photos in advance.
- Do not remove the battery pack or the AC Adaptor from this product while deleting the images. It may damage the memory card.
- Do not eject the memory card while deleting images.
- You cannot delete protected movies and photos. Undo the protection of the movies and photos, before you try to delete them (p. 33).

Tips

- You can delete the image using 🗑 on the playback screen.
- To delete all images recorded in the memory card, and recover all the recordable space of the memory card, format the memory card (p. 58).
- Reduced-size images which enable you to view many images at the same time on an index screen are called "thumbnails."

1 Select MENU (MENU) → [Edit/Copy] → [Delete] using the multi-selector.

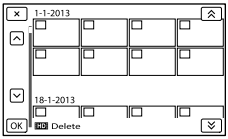
2 To select and delete movies, select [Multiple Images] → [HD MOVIE]/[PHOTO]/[HD MOVIE/PHOTO]*.



* Only 3D movies can be deleted in the 3D mode.

3 Select the movies or photos to be deleted, then select OK.

✔ is displayed on the selected images.

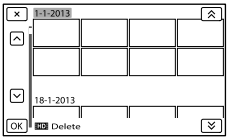


- Press PHOTO while selecting the desired thumbnail so that you can confirm the image. Select ✕ to return to the previous screen.

4 Select OK → OK.

To delete all movies/photos in an event at one time

① In step 2, select [All In Event].



② Select the desired event with ⏫ / ⏬, then select OK.

③ Select OK → OK.

Protecting recorded movies and photos (Protect)

Protect movies and photos to avoid deleting them by mistake.

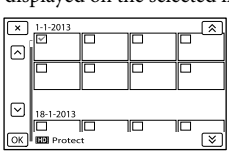
1 Select MENU (MENU) → [Edit/Copy] → [Protect] using the multi-selector.

2 To select and protect movies, select [Multiple Images] → [HD MOVIE]/[PHOTO]/[HD MOVIE/PHOTO]*.

* Only 3D movies can be protected in the 3D mode.

3 Select the movies and photos to be protected, then select OK.

✓ is displayed on the selected images.



- Press PHOTO while selecting the desired thumbnail so that you can confirm the image. Select ✕ to return to the previous screen.

4 Select OK → OK.

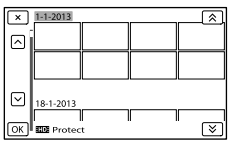
To undo the protection of movies and photos

Select the movie or photo marked with ✓ in step 3.

✓ disappears.

To protect all movies/photos in an event at one time

① In step 2, select [Set All In Event].



② Select the desired event with ⏫ / ⏬, then select OK.

③ Select OK → OK.

To undo the protection of an event

In step 2 above, select [Remove All In Event], select the desired movies/photos, then select OK → OK → OK.

Dividing a movie

You can divide a movie to delete unnecessary parts.

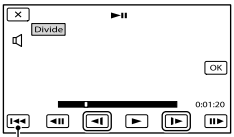
1 Select → [Divide] on the movie playback screen using the multi-selector.

2 Select ▶ to play back movies.

3 Select ⏸ at the point where you want to divide the movie into scenes.

The movie pauses.

4 Select ◀❙ / ❙▶ to adjust the dividing point with more precision.



Returns to the beginning of the selected movie

5 Select OK → OK.

Notes

- You cannot restore movies once they are divided.
- You cannot divide protected movie. Undo the protection of the movie, before you try to divide it (p. 33).
- Do not remove the battery pack or the AC Adaptor from this product while dividing the movie. It may damage the memory card.
- Do not eject the memory card while dividing movies.
- A slight difference may occur from the point where you select ⏸ and the actual dividing point, as this product selects the dividing point based on about 0.5 second increments.
- Only simple editing is available on this product. Install and use the "PlayMemories Home" software for more advanced editing.

Capturing a photo from a movie

You can capture images from movies recorded with this product.

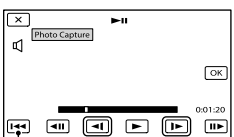
1 Select → [Photo Capture] on the movie playback screen using the multi-selector.

2 Select ▶ to play back movies.

3 Select ⏸ at the point where you want to capture a photo.

The movie pauses.

4 Select ◀I / I▶ to adjust the capturing point with more precision.



Returns to the beginning of the selected movie

5 Select OK.

The image size of captured photos from movies recorded with this product is [2.1 M] (16:9).

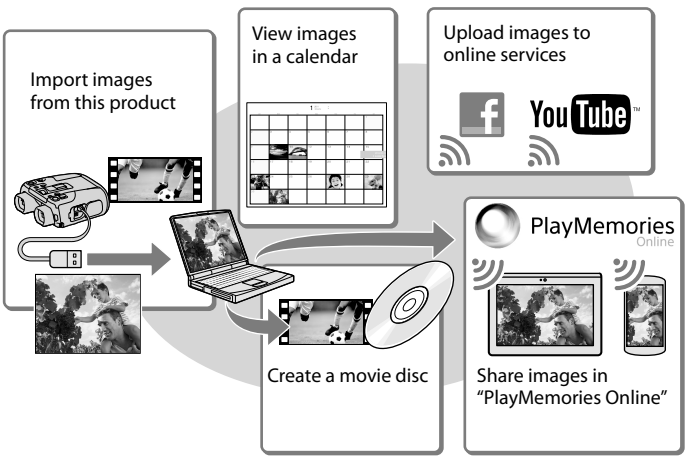
On recording date and time of captured photos

- The recording date and time of captured photos are the same as the recording date and time of the movies.
- If the movie you are capturing from has no data code, the recording date and time of the photo will be the date and time you captured from the movie.

Playing images on a computer

The “PlayMemories Home” software allows you to import movies and still images to your computer to use them in a variety of ways.

What you can do with “PlayMemories Home” software (Windows)



“PlayMemories Home” can be downloaded from the following URL.
www.sony.net/pm

Notes

- An Internet connection is required to install “PlayMemories Home.”
- An Internet connection is required to use “PlayMemories Online” and other online services. The services may not be available in some countries/regions.

Software for Mac

The “PlayMemories Home” software is not supported on Mac computers. To import images from this product to your Mac and play them, use the appropriate software on your Mac. For details, visit the following URL.
http://www.sony.co.jp/imsoft/Mac/

Preparing a computer
(Windows)

Checking the computer system

OS*1
Microsoft Windows XP SP3*2/Windows Vista SP2*3/Windows 7 SP1/Windows 8
CPU*4
Intel Core Duo 1.66 GHz or faster, or Intel Core 2 Duo 1.66 GHz or faster (Intel Core 2 Duo 2.26 GHz or faster is required when processing FX, FH or 3D movies, and Intel Core 2 Duo 2.40 GHz or faster is required when processing PS movies.)
Memory
Windows XP: 512 MB or more (1 GB or more is recommended) Windows Vista/ Windows 7/Windows 8: 1 GB or more
Hard disk
Disk volume required for installation: Approximately 500 MB
Display
Minimum 1,024 × 768 dots

*1 Standard installation is required. Operation is not assured if the OS has been upgraded or in a multi-boot environment.

*2 64-bit editions and Starter (Edition) are not supported. Windows Image Mastering API (IMAPI) Ver.2.0 or newer is required to use disc creation function, etc.

*3 Starter (Edition) is not supported.

*4 Faster processor is recommended.

Notes

- Operation with all computer environments is not assured.

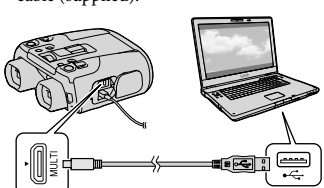
Installing the "PlayMemories Home" software in your computer

1 Access the following download site using an Internet browser on your computer, then click [Install] → [Run].

www.sony.net/pm

2 Install according to the on-screen instructions.

- When the on-screen instructions prompting you to connect this product to a computer appear, connect this product to your computer with the micro USB cable (supplied).



Micro USB cable (supplied)

- When the installation completes, "PlayMemories Home" starts up.

Notes on installation

- If the "PlayMemories Home" software is already installed on your computer, connect this product to your computer. Functions that can be used with this product will then be available.
- If the "PMB (Picture Motion Browser)" software is installed on your computer, it will be overwritten by the "PlayMemories Home" software. In this case, you cannot use some functions that were available with "PMB" with this "PlayMemories Home" software.

To disconnect this product from the computer

① Click the icon at the bottom right of the desktop of the computer → [Safely remove USB Mass Storage Device].

② Select [×] → [Yes] on the viewfinder screen.

③ Disconnect the micro USB cable.

- If you are using Windows 7 or Windows 8, click , then click .

Notes

- When you access this product from the computer, use the "PlayMemories Home" software. Operation is not guaranteed if you operate the data using software other than the "PlayMemories Home" software or you directly manipulate files and the folders from a computer.
- Images cannot be saved to some discs depending on the configuration selected in [REC Mode]. Movies recorded in [60p Quality PS] ([50p Quality PS]) or [Highest Quality FX] mode can only be saved to a Blu-ray disc.
- This product automatically divides an image file that exceeds 2 GB and saves the parts as separate files. All image files may be shown as separate files on a computer, however, the files will be handled properly by the import function and the playback function of this product or the "PlayMemories Home" software.

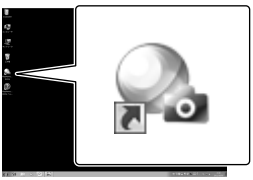
To create a Blu-ray disc

You can create a Blu-ray disc with a high definition image quality (HD) movie previously imported to a computer.
To create a Blu-ray disc, the "BD Add-on Software" must be installed.
http://support.d-imaging.sony.co.jp/BDUW/

- Your computer must support the creation of Blu-ray discs.
- BD-R (unrewritable) and BD-RE (rewritable) media are available for creating Blu-ray discs. You cannot add contents to either type of disc after creating the disc.
- To play back a Blu-ray disc that has been created with a movie that was recorded in 3D or [60p Quality PS] ([50p Quality PS]) image quality, you need a device that complies with the AVCHD Ver. 2.0 format.

Starting the "PlayMemories Home" software

1 Double-click the "PlayMemories Home" icon on the computer screen.



- When using Windows 8, select the "PlayMemories Home" icon from the start screen.

2 Double-click the "PlayMemories Home Help Guide" short-cut icon on the computer screen to see how to use "PlayMemories Home."

- When using Windows 8, select [PlayMemories Home Help Guide] from the help menu of "PlayMemories Home."
- If the icon is not displayed on the computer screen, click [Start] → [All Programs] → [PlayMemories Home] → the desired item.
- For details on "PlayMemories Home," select ? ("PlayMemories Home Help Guide") on the software or visit the PlayMemories Home support page (http://www.sony.co.jp/pmh-se/).

Downloading the dedicated software for this product

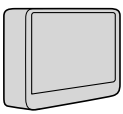
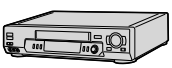
You can install the dedicated software for this product from the following URL.
For Windows:
http://www.sony.co.jp/imsoft/Win/
For Mac:
http://www.sony.co.jp/imsoft/Mac/

Notes

- The software that can be used with this product will differ, depending on the countries/regions.

Selecting a method for saving images on an external device

You can save movies on an external device. Select the method to be used according to the device.

Movies	External devices	Connecting cable	Page
3D/2D	 **External media device** Saving images on an external media device with high definition image quality.	USB Adaptor Cable (sold separately)	40
2D	 **Hard disk recorder, etc.** Saving images on a DVD disc with standard definition image quality.	AV Cable (sold separately)	43

Notes

- The AVCHD recording disc can be played back only on AVCHD format compatible devices.
- Discs with high definition image quality images recorded should not be used in DVD players/recorders. Because DVD players/recorders are not compatible with the AVCHD format, DVD players/recorders may fail to eject the disc.

The types of media on which images are saved

See page 29.

The devices on which the created disc can be played back

Blu-ray Disc

Blu-ray disc playback devices, such as a Sony Blu-ray disc player or a PlayStation®3.

DVD disc with high definition image quality

AVCHD format playback devices, such as a Sony Blu-ray disc player or a PlayStation®3.

DVD disc with standard definition image quality

Ordinary DVD playback devices, such as a DVD player.

Notes

- Always maintain your PlayStation®3 to use the latest version of the PlayStation®3 system software.
- The PlayStation®3 may not be available in some countries/regions.

Saving images on an external media device

You can save movies and photos on an external media device (USB storage devices), such as an external hard disk drive. You can also play back images on this product or another playback device.

Notes
- For this operation, USB Adaptor Cable VMC-UAM2 (sold separately) is required.
- Connect this product to the wall outlet (wall socket) using the supplied AC Adaptor for this operation (p. 13).
- Refer to the instruction manual supplied with the external media device.

Tips
- You can save 3D movies on an external media device as they are.
- You can import images saved on the external media device to your computer by using the "PlayMemories Home" software.

Functions available after saving images on an external media device

– playback of images through this product (p. 42)
– importing images to "PlayMemories Home" software (p. 38)

Devices that cannot be used as an external media device

You cannot use the following devices as an external media device.

– media devices with a capacity exceeding 2 TB
– ordinary disc drive such as CD or DVD drive
– media devices connected via a USB hub
– media devices with built-in USB hub
– card reader

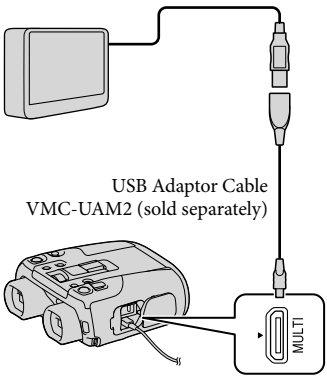
Notes
- You may not be able to use external media devices with a code function.
- The FAT file system is available for this product. If the storage medium of the external device was formatted for the NTFS file system, etc., format the external media device using this product before use. The format screen appears when an external media device is connected to this product. Make sure that important data has not previously been saved on the external media device before you format it using this product.
- Operation is not assured with every device satisfying the requirements for operation.
- For details on available external media devices, go to the Sony support website in your country/region.

1 Connect the AC Adaptor and the power cord (mains lead) to the DC IN jack of this product and the wall outlet (wall socket) (p. 13).

2 If the external media device has the AC power cable, connect it to the wall outlet (wall socket).

3 Connect this product and the external media device using the USB Adaptor Cable (sold separately).

Make sure not to disconnect the USB cable while [Preparing image database file. Please wait.] is displayed on the screen. If [Repair Img. DB F.] is displayed on the screen of this product, select OK.



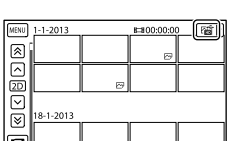
4 Select [Copy.] on the screen of this product.

Movies and photos that are stored on the memory card in this product, and that have not yet been saved on external media device can be saved on the connected media device at this time.

- This operation is available only when there are newly recorded images.

When connecting an external media device

The images saved in the external media device are displayed on the screen. When an external media device is connected, the USB icon will appear on the index screen, etc.



You can make menu settings of the external media device such as deleting images. Select MENU (MENU) → [Edit/Copy] on the index screen.

To disconnect the external media device

① Select while this product is in the playback standby mode (index is displayed) of the external media device.
② Disconnect the USB Adaptor Cable.

Notes

- The number of scenes you can save on an external media device are as follows. However, even if the external media device has free space, you cannot save scenes exceeding the following number.
  – Movies: Max. 3,999 (2D and 3D collectively)
  – Photos: Max. 40,000
  The number of scenes may be smaller depending on this product setting and the type of images recorded.

Saving desired movies and photos

You can save desired images in this product to the external media device.

1 Connect this product to the external media device and select [Play without copying.].

Index of the external medium is displayed.

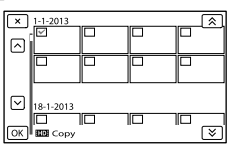
2 Select MENU (MENU) → [Edit/Copy] → [Copy].

3 Follow the instructions that appear on the viewfinder screen to select the image selection methods and type of the image.

- You cannot copy images from an external media device to the memory card in this product.

4 When you selected [Multiple Images], select the image to be saved, then select OK.

✔ appears.



- Press PHOTO while selecting the desired thumbnail to confirm the image. Select ✕ to return to the previous screen.
- If you select [All In Event], select the event to copy with ⌃ / ⌄. You cannot select multiple events.

5 Select OK → OK on the screen of this product.

Playing back images in the external media device on this product

1 Connect this product to the external media device and select [Play without copying.].

Index of the external media device is displayed.

2 Select the image you want to view and play back the image (p. 23).

- You can also view images on a TV connected to this product (p. 25).
- You can play back the high definition image quality movies on your computer using "PlayMemories Home." Start "PlayMemories Home," and select the drive where the external media device is connected with [Settings].

To perform [Direct Copy] manually

You can perform [Direct Copy] manually while this product is connected to an external media device.

① Select MENU (MENU) → [Edit/Copy] → [Direct Copy] on the Event Index screen of the external media device.
② Select [Copy images that have not been copied.].
③ Select OK → OK.

Notes

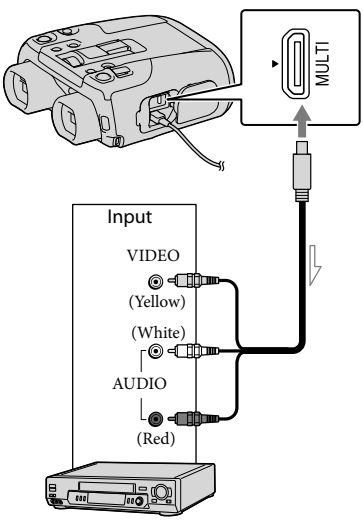
- If this product does not recognize the external media device, try the following operations.
  – Reconnect the USB Adaptor Cable to this product.
  – If the external media device has the AC power cord (mains lead), connect it to the wall outlet (wall socket).

Creating a standard definition image quality disc with a recorder, etc.

You can copy images played back on this product on a disc or video cassette, by connecting this product to a disc recorder, etc. with an AV Cable (sold separately). Refer also to the instruction manuals supplied with the devices to be connected.

Notes

- 3D movies are converted to 2D with standard definition image quality.
- Connect this product to the wall outlet (wall socket) using the supplied AC Adaptor for this operation (p. 13).
- High definition image quality movies will be copied with standard definition image quality.



Signal flow

1 Insert the recording media in the recording device.

- If your recording device has an input selector, set it to the input mode.

2 Connect this product to the recording device (a disc recorder, etc.) with an AV Cable (sold separately).

- Connect this product to the input jacks of the recording device.

3 Start playback on this product, and record it on the recording device.

- Refer to the instruction manuals supplied with your recording device for details.

4 When dubbing is finished, stop the recording device, and then this product.

Notes

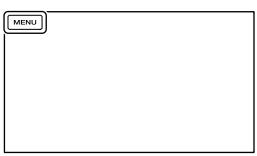
- Since copying is performed via analog data transfer, the image quality may deteriorate.
- You cannot copy images to recorders connected via an HDMI cable.
- To copy date/time information, camera data, and coordinates (DEV-50V), select MENU (MENU) → [Setup] → [Playback Settings] → [Data Code] → a desired setting → OK.
- When the screen size of display devices (TV, etc.) is 4:3, select MENU (MENU) → [Setup] → [Connection] → [TV Type] → [4:3] → OK.
- When you connect a monaural device, connect the yellow plug of an AV Cable (sold separately) to the video input jack, and the white (left channel) or the red (right channel) plug to the audio input jack on the device.

Using menus

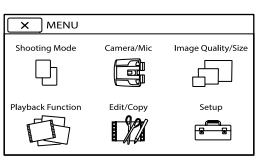
This product has various menu items under each of 6 menu categories.

Shooting Mode
Camera/Mic
Image Quality/Size
Playback Function
Edit/Copy
Setup

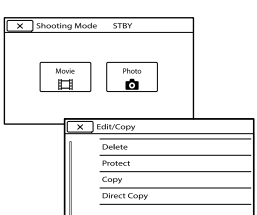
1 Select MENU (MENU).



2 Select a category.



3 Select your desired menu item.

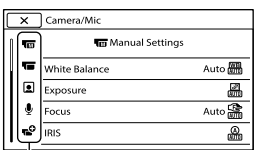


Notes

- Select [X] to finish setting the menu or to return to the previous menu screen.

To find a menu item quickly

The [Camera/Mic] and [Setup] menus have sub-categories. Select the sub-category icon so that the screen displays the list of menus in the sub-category selected.

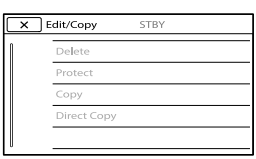


Sub-category icons

When you cannot select a menu item

Grayed out menu items or settings are not available.

When you select the grayed out menu item, this product displays the reason why you cannot select the menu item or the instruction of under which condition you can set the menu item.



Menu lists

The available menu items differ between the movie mode (🎞) and photo mode (📷).

Shooting Mode

Movie	Records movies.	21
Photo	Shoots photos.	22

Camera/Mic

Manual Settings

White Balance	Adjusts the color balance to the recording environment.	48
Exposure	Adjusts the brightness of movies and photos.	49
Focus	Focuses manually.	49
IRIS	Adjusts the iris.	50
Shutter Speed	Adjusts the shutter speed.	50
AE Shift	Adjusts the exposure based on the results of the automatic exposure measurement.	50
White Balance Shift	Adjusts the white balance manually.	50
Low Lux	Records bright color images in the dim.	51
Hyper Gain	Records bright images in dark places by increasing the gain.	51

Camera Settings

Auto 3D Lens Adjust	Automatically corrects the vertical position of the right and left movies to record 3D movies that can be viewed comfortably, without blurring.	51
Scene Selection	Selects an appropriate recording setting according to the type of scene, such as night view or beach.	51
📷 Self-Timer	Sets the self-timer when this product is in photo recording mode.	52
Tele Macro	Shoots a subject in focus with the background out of focus.	52
🎞 SteadyShot	Sets the SteadyShot function when recording movies.	53
📷 SteadyShot	Sets the SteadyShot function when shooting photos.	53
Digital Zoom	Sets the digital zoom.	53
Auto Back Light	Adjusts the exposure for backlit subjects automatically.	53
Dial Setting	Assigns a function to the MANUAL dial.	30

Face

Face Detection	Adjusts the image quality of the face(s) automatically.	54

Microphone

Closer Voice	Detects human faces and records the associated voice clearly.	54
Auto Wind NR	Recognizes the recording conditions and reduces the wind noise.	54

Micref Level	Sets the microphone reference level.	55
Shooting Assist		
My Button	Assigns functions to My Buttons.	55
Grid Line	Displays grid lines as a guide to make sure the subject is horizontal or vertical.	55
Display Setting	Sets the duration that icons or indicators are displayed in the viewfinder.	55
Image Quality/Size		
REC Mode	Sets the mode to record movies. When recording fast moving subject, a high image quality is recommended.	28
Frame Rate	Sets the frame rate to record movies.	56
2D/3D Mode Select	Switches the movie recording type between 2D and 3D.	56
x.v.Color	Records wider range of colors.	56
Image Size	Sets the photo size.	57
Playback Function		
	Plays back movies or photos.	23
Edit/Copy		
Delete	Deletes movies or photos.	32
Protect	Protects movies or photos to avoid deleting.	33
Copy	Copies movies or photos to external media devices.	41
Direct Copy	Copies all movies and photos that have not yet been saved on an external media device.	42
Setup		
Media Settings		
Media Info	Displays memory card information, such as free space.	58
Format	Deletes all data on the memory card.	58
Repair Img. DB F.	Repairs the image database file on a memory card.	68, 72
File Number	Sets how to assign the file number.	58
Playback Settings		
Data Code	Displays the detailed recording data during playback.	58
Volume	Adjusts the volume of playback sound, and the volume of sound output to monitoring headphones during recording.	24, 59
Connection		
TV Type	Sets the aspect ratio to suit the connected TV.	59

HDMI 3D Setting	Select the output format of the right and left images when you connect this product to a 3D TV with the HDMI cable (supplied).	60
HDMI Resolution	Select the output image resolution when connecting this product to a TV with the HDMI cable (supplied).	60
CTRL FOR HDMI	Sets whether or not the TV's Remote Commander is to be used when this product is connected to a "BRAVIA" Sync compatible TV with the HDMI cable (supplied).	60
USB Connect	Connects this product to an external device via USB.	60
USB LUN Setting	Sets this product to improve the compatibility of a USB connection by restricting some USB functions.	61
General Settings		
VF Brightness	Adjusts the brightness of the viewfinder.	61
Viewfinder Adjust	Adjusts the relative vertical position of the right and left viewfinder.	61
GPS Information*	Displays location information.	61
GPS Setting*	Sets the GPS.	62
REC Lamp	Sets the recording lamp to light up or not.	62
Beep	Sets whether this product sounds operation beeps or not.	62
Language Setting	Sets the display language.	62
60i/50i Sel	Switch 1080/60i (NTSC-system) and 1080/50i (PAL-system).	62
Battery Info	Displays the battery information.	62
Power Save	Sets the power to turn off automatically.	63
Initialize	Initializes all the settings to the default settings.	63
Clock Settings		
Date & Time Setting	Sets the [Date & Time Format], [Summer Time], or [Date & Time].	63
Area Setting	Adjusts for a time difference without stopping the clock.	63
Auto Clock ADJ *	Compensates for time automatically by acquiring location information from the GPS system.	64
Auto Area ADJ*	Compensates for time differences automatically by acquiring location information from the GPS system.	64

* DEV-50V

Shooting Mode

(Items for selecting a shooting mode)

See “Using menus” (p. 44) on the operation.

Movie

You can record movies.

Photo

You can shoot photos.

Camera/Mic

(Items for customized shooting)

See “Using menus” (p. 44) on the operation.
The default settings are marked with ▶.

White Balance

You can adjust the color balance to the recording environment.

▶ WB AUTO (Auto)
The white balance is adjusted automatically.

☀ (Outdoor)
The white balance is appropriately adjusted for the following recording conditions:
- Outdoors
- Night views, neon signs and fireworks
- Sunrise or sunset
- Under daylight fluorescent lamps

(Indoor)
The white balance is appropriately adjusted for the following recording conditions:
- Indoors
- At stages where the lighting conditions change quickly
- Under video lamps, sodium lamps, or incandescent-like color lamps

(One Push)
The white balance will be adjusted according to the ambient light.
① Select [ ].
② Frame a white object such as a piece of paper, to fill the screen under the same lighting conditions as you will shoot the subject.
③ Select [SET].

Notes

- Set [White Balance] to [Auto] or adjust the color in [One Push] under white or cool white fluorescent lamps.
- When you select [One Push], keep framing white objects.
- If you set [White Balance], [Scene Selection] is set to [Auto].

Tips

- If you have changed the battery pack while [Auto] was selected, or taken this product outdoors after inside use (or vice versa), aim this product at a nearby white object for about 10 seconds for better color balance adjustment.
- When the white balance has been set with [One Push], if the lighting conditions changed by bringing this product outdoors from inside the house, or vice versa, you need to redo the [One Push] procedure to readjust the white balance.

Exposure

You can fix the brightness of a picture manually. Adjust the brightness when the subject is too bright or too dark.

▶ Auto
Adjusts the exposure automatically.

Manual
Adjusts the exposure manually.

When you set [Exposure] to [Manual], select [−] / [+] to adjust the brightness.

Tips

- You can also adjust manually by using the MANUAL dial (p. 30).

Focus

You can adjust the focus manually. You can select this function also when you want to focus on a certain subject intentionally.

▶ Auto
Adjusts the focus automatically.

Manual
Adjusts the focus manually.

When you set [Focus] to [Manual], select [nearby subject) / [distant subject) to adjust the focus.

Notes

- When you set [Focus] to [Manual], appears.

Tips

- appears when the focus cannot be adjusted any closer, and appears when the focus cannot be adjusted farther away.
- It is easier to focus on the subject by moving the power zoom lever towards T (telephoto) to adjust the focus, then towards W (wide angle) to adjust the zoom for recording. When you want to record a subject at close range, move the power zoom lever to W (wide angle), then adjust the focus.
- The focal distance information (distance at which the subject is focused on; used as a guide if it is dark and focus adjustment is difficult) appears for a few seconds in the following cases.
  – When the focus mode is switched from automatic to manual
  – When you set focus manually
- You can also adjust manually by using the MANUAL dial (p. 30).

IRIS

You can shoot images with the IRIS priority mode. If you adjust the IRIS, you can sharpen the subject with its background blurred or sharpen the whole image.

▶ Auto
Adjusts IRIS automatically.

Manual
Adjusts IRIS manually.

Tips
- You can also adjust manually by using the MANUAL dial (p. 30).

Shutter Speed

You can shoot images with the Shutter Speed priority mode. When you shoot a moving subject at a higher shutter speed, it appears as if frozen on the image. At a lower shutter speed, the subject appears as if it is flowing.

▶ Auto
Adjusts the shutter speed automatically.

Manual
Adjusts the shutter speed manually.

Tips
- You can also adjust manually by using the MANUAL dial (p. 30).

AE Shift

You can adjust the exposure based on the results of the automatic exposure measurement.

▶ Off
Adjusts the exposure automatically.

On (Adjusted number and EV)
Adjusts the exposure manually.
Select + to record a brighter image, or select − to record a darker image.

Tips
- You can adjust the automatic exposure level to brighter or darker when [Exposure] is set to [Auto].
- You can also adjust manually by using the MANUAL dial (p. 30).

White Balance Shift

You can adjust the white balance manually.

▶ Off
Adjusts the white balance automatically.

On (WS and adjusted number)
Adjusts the white balance manually.

Tips
- To adjust the white balance, select + when images appear bluish or − when images appear reddish.
- You can also adjust manually by using the MANUAL dial (p. 30).

Low Lux

You can record bright color images, even in dim light.

▶ Off
The Low Lux function is not used.

On ( )
The Low Lux function is used.

Hyper Gain

You can record bright images in dark places by increasing the gain.

▶ Off
The Hyper Gain function is not used.

On (HYPER)
The Hyper Gain function is used.

Notes
- The image quality deteriorates due to noise when using [Hyper Gain]. In addition, the color of the image becomes light.
- If you turn this product off and on again, [Hyper Gain] automatically returns to [Off] (the default setting).
- The gain value is displayed as [---] on the screen when [Hyper Gain] is set to [On] and displaying the data code during playback.

Auto 3D Lens Adjust

Automatically corrects the vertical position of the right and left images to record 3D movies and display 3D movies in the viewfinder that can be viewed comfortably, without blurring.
Aim this product at a subject that produces a scale higher than the ◂ mark on the screen, and then select OK (p. 16).

Notes
- Use [Auto 3D Lens Adjust] in the following cases.
  – When you feel that the 3D movies do not look the way you want them to
  – When you have not adjusted the 3D lenses for a while
  – When a strong mechanical shock has been applied to this product
  – When using this product in a very hot or cold place
- After performing [Auto 3D Lens Adjust], the viewfinder display mode switches to 3D.

Tip
- If [Could not adjust.] appears while zooming out, select [Run Again].

Scene Selection

You can record images effectively in various situations by using the following preset recording modes.

▶ SCN AUTO (Auto)
Adjusts image quality automatically.

(Night Scene)*
Maintains the dark atmosphere of the distant surroundings in night scenes shot using a tripod (sold separately).

(Sunrise&Sunset)*

Reproduces the atmosphere of scenes such as sunsets or sunrises.

(Fireworks)*

Takes spectacular shots of fireworks.

(Landscape)*

Shoots distant subjects clearly. This setting also prevents this product from focusing on glass or metal mesh in windows between this product and the subject.

(Portrait)

Brings out the subject such as people or flowers while creating a soft background.

(Spotlight)**

Prevents people's faces from appearing excessively white when subjects are lit by strong light.

(Beach)**

Takes the vivid blue of the ocean or a lake.

(Snow)**

Takes bright pictures of a white landscape.

* Adjusted to focus on subjects farther away only.

** Adjusted not to focus on subjects a short distance away.

Notes

- If you set [Scene Selection], [White Balance], [IRIS] and [Shutter Speed] settings are canceled.

Self-Timer

Press PHOTO to start the count down. A photo is recorded after about 10 seconds.

▶ Off

Cancels the self-timer.

On ()

Starts the self-timer recording. Once you shoot a photo, the setting is canceled. To cancel recording, select ×.

Notes

- If you change the [2D/3D Mode Select] setting, the [Self-Timer] setting returns to default.

Tele Macro

This is useful to shoot small subjects, such as flowers or insects. You can blur out backgrounds and the subject stands out clearer.

▶ Off

Cancels Tele Macro. (Tele Macro is also canceled when you move the zoom lever to the W side.)

On ()

The zoom (p. 19) moves to the top of the T (telephoto) side automatically and allows recording subjects at close range down to about 38 cm (15 in.).

Notes

- If you change the [2D/3D Mode Select] setting, the [Tele Macro] setting returns to default.
- When recording a distant subject, focusing may be difficult and can take some time.
- Adjust the focus manually ([Focus], p. 49) when it is hard to focus automatically.

SteadyShot

You can compensate for camera shake. Set [SteadyShot] to [Off] ( ) when using a tripod (sold separately), then the image becomes natural.

▶ Active
Provides a more powerful SteadyShot effect.

Standard
Provides a SteadyShot effect, performing wide-angle recording under relatively stable recording conditions.

Off ( )
The SteadyShot function is not used.

Notes
- If you change the setting of [SteadyShot], the imaging field will also change accordingly.

SteadyShot

You can compensate for camera shake. Set [SteadyShot] to [Off] ( ) when using a tripod (sold separately), then the image becomes natural.

▶ On
The SteadyShot function is used.

Off ( )
The SteadyShot function is not used.

Digital Zoom

You can change the maximum zoom level. Note that the image quality decreases when you use the digital zoom.

▶ On
The digital zoom is used.

Off
The digital zoom is not used.

Tips
- You can change the setting only in the 2D mode.
- [Digital Zoom] is fixed to [On] while recording photos.

Auto Back Light

This product can adjust the exposure for backlit subjects automatically.

▶ On
Adjusts the exposure for backlit subjects automatically.

Off
Does not adjust the exposure for backlit subjects.

Dial Setting

You can select an item you want to set to the MANUAL dial. For details, see page 30.

Face Detection

You can set this product to detect a face automatically.
It adjusts the focus/color/exposure automatically for the face of the subject.

Auto
Detects faces without distinction between adults and children.

Child Priority
Gives faces of children priority.

Adult Priority
Gives faces of adults priority.

▶ Off
Does not detect faces.

Notes
- The frame does not appear on faces, even when this product detects the faces.
- Faces may not be detected depending on recording conditions, subject conditions, and the setting of this product.
- [Face Detection] may not function properly depending on recording conditions. Set [Face Detection] to [Off] in this case.

Tips
- For better face detection performance, shoot the subject(s) under the following conditions:
  – Shoot in a sufficiently bright place
  – The subject(s) does not wear glasses, a hat or mask
  – The subject(s) faces directly towards this product

Closer Voice

This product detects a face of a person and records the voice clearly.

On
Records human voices clearly.

▶ Off
Records ambient sound faithfully. When you want to record the sound clearly without any interference, for example when you record a music concert, set [Closer Voice] to [Off].

Notes
- The [Closer Voice] function does not activate while an external microphone is connected to this product.

Auto Wind NR

This product records a movie with less wind noise input from the built-in microphone. This function automatically cuts the low-range wind noise according to the noise level.

Off
Does not reduce the wind noise.

▶ On
Reduces the wind noise.

Notes
- When you set [Auto Wind NR] to [Off], [Intelligent Auto] is set to [Off].
- [Auto Wind NR] will not function while an external microphone is attached to this product.

Micref Level (Microphone reference level)

You can select the microphone level for recording sound.

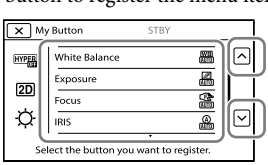
▶ Normal
Records ambient sounds, converting them into the appropriate level.

Low ( )
Records ambient sound faithfully. Select [Low] when you want to record an exciting and powerful sound in a concert hall, etc. (This setting is not suitable for recording conversations.)

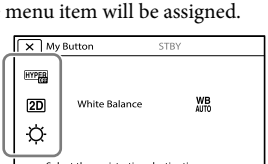
My Button

You can assign functions that you frequently use when recording to one of the My Buttons.

① Enter the [My Button] menu. Select the menu item that you want to assign to a My Button using / , then select the button to register the menu item to.



② Select one of the My Buttons to which the menu item will be assigned.



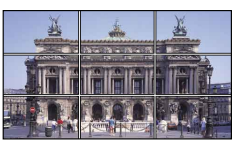
③ Select OK.

Grid Line

You can display the grid line and check that the subject is horizontal or vertical.
The grid line is not recorded.

▶ Off
Does not display the grid line.

On
Displays the grid line.



Notes
- The grid line cannot be displayed while recording movies.

Tips
- Positioning the subject at the cross point of the grid line makes a balanced composition.

Display Setting

You can set the duration icons and indicators to be displayed in the viewfinder when recording.

▶ Auto
Displays for about 3 seconds.

On
Always displays.

Tips
- The icons or indicators are displayed in the following cases.
  – When you turn on this product.
  – When you operate the multi-selector.
  – When you switch this product to the movie recording, photo recording, or playback mode.

Image Quality/Size (Items for setting up image quality or size)

See “Using menus” (p. 44) on the operation. The default settings are marked with ▶.

REC Mode

See page 28.

Frame Rate

Using [60i] ([50i]) is recommended for standard recording. Set [Frame Rate] first, before setting [REC Mode] (p. 28).

▶ 60i (50i)
For ordinary recording, this frame rate is recommended.

60p (50p)
You can record movies with a volume of data twice that of 60i (50i) with this setting, and this will allow you to enjoy clear images. When you play a movie recorded with this setting on a TV, the TV has to be compatible with 60p (50p) movie playback. If the TV is not compatible with 60p (50p) movie playback, the movie will be output as a 60i (50i) movie.

Notes
- The media that the recorded images can be saved on will depend on the recording mode that has been set during recording. For details, see page 29.

Tips
- Frame rate means the number of images that are updated in a certain period of time.

2D/3D Mode Select

You can switch the operating mode of this product between 2D and 3D.

▶ 2D
Records/plays the 2D movie.

3D
Records/plays the 3D movie.

Notes
- When you record 3D movies, the binocular magnification can be set to up to about 6 times. If you want to watch or record a subject using a larger image, set [2D/3D Mode Select] to [2D].
- In 3D mode, you cannot shoot and play back photos.

x.v.Color

You can capture wider range of colors. Various colors such as the brilliant color of flowers and turquoise blue of the sea can be more faithfully reproduced. Refer to the instruction manuals of the TV.

▶ On
Records in x.v.Color.

Off
Records in ordinary color range.

Notes
- If the movie recorded with this function [On] is played back on a non-x.v.Color-compliant TV, the color may not be reproduced correctly.

Image Size

You can select a size for the photos you are going to shot.

▶ 16:9 L (20.4M)
Records photos clearly in the 16:9 (wide) ratio (6,016 × 3,384).

4:3 L (15.3M)
Records photos clearly (4,512 × 3,384).

16:9 M (10.0M)
Allows you to record more photos in relatively clear quality at the 16:9 (wide) ratio (4,224 × 2,376).

4:3 M (5.0M)
Allows you to record more photos in relatively clear quality (2,592 × 1,944).

16:9 S (2.1M)
Allows the maximum number of photos to be recorded in the 16:9 (wide) ratio (1,920 × 1,080).

4:3 S (VGA)
Allows the maximum number of photos to be recorded (640 × 480).

Notes
- See page 75 for the number of recordable photos.

Edit/Copy
(Items for editing)

See “Using menus” (p. 44) on the operation.

Delete

See page 32.

Protect

See page 33.

Copy

See page 41.

Direct Copy

See page 42.

Setup

(Other setup items)

See “Using menus” (p. 44) on the operation.
The default settings are marked with ▶.

Media Info

You can check the remaining recordable time for each recording mode of the recording media for movies and the approximate free and used media space of the memory card.

To turn off the display

Select [×].

Notes

- Since there is a management file area, the used space is not displayed as 0 % even if you perform [Format] (p. 58).

Format

Formatting deletes all the movies and photos to recover recordable free space.
Select [OK] → [OK].

Notes

- Connect this product to the wall outlet (wall socket) using the supplied AC Adaptor for this operation (p. 13).
- To avoid the loss of important images, you should save them before formatting the memory card.
- Protected movies and photos will also be deleted.
- While [Executing...] is displayed, do not operate the buttons on this product, disconnect the AC Adaptor, or eject the memory card from this product. (The access lamp is lit or flashing while formatting memory card.)

Repair Img. DB F.

See page 68, 72.

File Number

You can select the way to assign file number of photos.

▶ Series
Assigns file numbers of photos in sequence. The file number becomes larger each time you record a photo.
Even if the memory card is replaced with another one, the file number is assigned in sequence.

Reset
Assigns file numbers in sequence, following the largest file number existing on the recording medium.
When the memory card is replaced with another one, the file number is assigned for each memory card.

Data Code

During playback, this product displays the information (Date/Time, Camera Data, Coordinates*) recorded automatically at the time of recording.

▶ Off
Data code is not displayed.

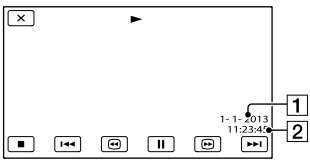
Date/Time
Displays the date and time.

Camera Data
Displays camera setting data.

Coordinates*
Displays coordinates.

* DEV-50V

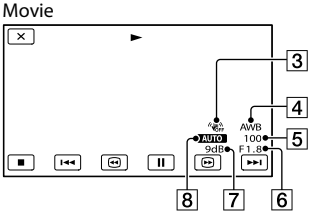
Date/Time



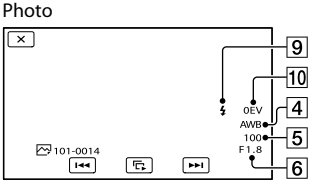
1 Date
2 Time

Camera Data

Movie

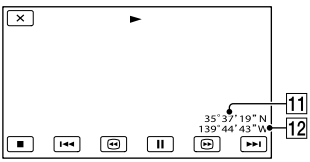


Photo



3 SteadyShot off
4 White Balance
5 Shutter Speed
6 IRIS (Aperture value)
7 Gain
8 Brightness
9 Flash
10 Exposure compensation value

Coordinates (DEV-50V)



11 Latitude
12 Longitude

Tips

- The data code is displayed on the TV screen if you connect this product to a TV.
- Depending on the memory card condition, bars [--:--:--] appear.

Volume

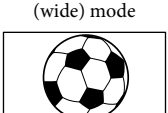
You can adjust the volume of playback sound by selecting [−] / [+].

TV Type

You need to convert the signal depending on the TV connected when playing back movies and photos. The recorded movies and photos are played back as following illustrations.

▶ 16:9

Select this to view your movies on a 16:9 (wide) TV. The recorded movies and photos are played back as shown below.

Movies and photos recorded in 16:9 (wide) mode	Movies and photos recorded in 4:3 mode
	

4:3
Select this to view your movies and photos on a 4:3 standard TV. The recorded movies and photos are played back as shown below.

Movies and photos recorded in 16:9 (wide) mode	Movies and photos recorded in 4:3 mode

Notes
- Horizontal to vertical ratio of movies is 16:9.

HDMI 3D Setting

Select the output format of the right and left images when connecting this product to a 3D TV with the HDMI cable (supplied).

▶ Auto
Normal setting (automatically outputs the images according to the TV).

Frame Packing
Outputs the right and left images in high definition image quality as they were recorded.

Side-by-Side
Halves the resolution of the right and left images in high definition image quality, and outputs the right and left images aligned side by side.

HDMI Resolution

Select the output image resolution when connecting this product to a TV with the HDMI cable (supplied).

▶ Auto
Normal setting (outputs the signal according to the TV automatically).

1080p
Outputs movies with a 1080p signal.

1080i
Outputs movies with a 1080i signal.

720p
Outputs movies with a 720p signal.

480p (576p)
Outputs the 480p (576p) signal.

480i (576i)
Outputs the 480i (576i) signal.

Notes
- When [Frame Rate] is set to [60p] ([50p]) and [HDMI Resolution] is set to [720p] or [480p] ([576p]), HDMI signals cannot be output during recording.

CTRL FOR HDMI (Control for HDMI)

When connecting this product to a "BRAVIA" Sync compatible TV with the HDMI cable (supplied), you can play back movies on this product by aiming the TV's Remote Commander at the TV (p. 27).

▶ On
Operates this product using the TV's Remote Commander.

Off
Does not operate this product using the TV's Remote Commander.

USB Connect

Select this item when the USB connection does not start even if connecting this product to a device with the micro USB cable (supplied).

USB LUN Setting

Improves compatibility with external devices by limiting the functions of the USB connection.

▶ Multi
Use this setting for ordinary operations.

Single
Try this setting only if you cannot connect to an external device.

VF Brightness

You can adjust the brightness of the viewfinder in five steps.

Viewfinder Adjust

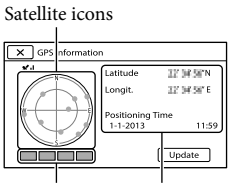
Adjust the relative vertical position of the right and left viewfinder to allow you to view 3D images comfortably.
Move the horizontal line to overlap the vertical lines by selecting + / −, and select OK when these lines overlap (p. 15).
The viewfinder adjustment dialog may appear automatically depending on the status of this product.

Notes

- Use [Viewfinder Adjust] in the following cases.
  - When you feel uncomfortable viewing images in 3D
  - When the user of this product changes
  - When strong physical shock has been applied to this product
  - When you use this product under extremely hot or cold conditions
- When the vertical and horizontal lines will not overlap or the horizontal line is extremely tilted, stop using this product and contact your Sony dealer or local authorized Sony service facility.

GPS Information (DEV-50V)

This product can display location information.



How to check the triangulating information

Color of the satellites/ triangulating gauge	Status
●/■ (black)	No signal, but orbit information for the satellite is available.
●/■ (gray)	33 % of the satellite orbit information has been obtained.
●/■ (brown)	66 % of the satellite orbit information has been obtained.
●/■ (ocher)	99 % of the satellite orbit information has been obtained.
●/■ (green)	Triangulating is completed and the satellite is currently being used.

If your current location information cannot be triangulated

This product starts the triangulating priority mode. As this product turns other functions off to search for satellites, obtaining GPS information can take priority.
Select [Update] to receive location information manually.

To close the triangulating information screen

Select [×].

GPS Setting (DEV-50V)

You can select whether this product receives or does not receive GPS signals (p. 29).

▶ On
Receives GPS signals.

Off
Does not receive GPS signals.

Notes

- The location information will not be recorded until triangulating is finished successfully after you switch the [GPS Setting] to [On].

REC Lamp (Recording lamp)

You can make the recording lamp on the back of this product so it will not turn on.

▶ On
The camera recording lamp lights up.

Off
The camera recording lamp does not light up.

Beep

On
A melody sounds when you start/stop recording, or operate buttons.

▶ Off
Cancels the melody.

Language Setting

You can select the language to be used on the screen.

60i/50i Sel

Select the settings depending on the TV color systems of the countries/regions where you use this product.
Select 60i when TV color system is NTSC, and select 50i when TV color system is PAL.

Notes

- You cannot record/play back in the setting of 50i (60i) for the memory card which is formatted or recorded in the setting of 60i (50i). Use another memory card or perform [Format] if the message [A movie with a different video signal format from this device has been recorded. Movie recording disabled.] is displayed after switched the setting of [60i/50i Sel].

Battery Info

You can check the estimated remaining capacity of the battery (expected recording and playing time).

Power Save

You can set this product to turn off automatically when you do not operate this product for more than about 5 minutes.

On
This product turns off automatically.

▶ Off
This product does not turn off automatically.

Notes
- When you connect this product to a wall outlet (wall socket), this product does not turn off automatically.

Initialize

All the settings return to the default. Even if you use this function, all movies and photos are retained.

Date & Time Setting

■ Date & Time Format

You can select one from 4 types of date and time format.

■ Summer Time

You can change this setting without stopping the clock. Set to [On] to move the time forward 1 hour.

▶ Off
Does not set the summer time.

On
Sets the summer time.

■ Date & Time

You can set the date and time. Select ◀/▶ to select the item, and select ▲/▼ to set the value.

Area Setting

You can adjust a time difference without stopping the clock. Select your local area when using this product in other time zones. Refer to the world time difference information on page 78.

DEV-30/50

▶ Home
Select this item when you are going to use this product in the area where you are living.

Destination
Select this item when you want to use this product with the area setting set to another place.

Tips
- If you visit a certain place often and want to use this product with the area setting of that place, it is useful if you set the place to [Destination].
- Select OFF / ON at the bottom left on the screen to set summer time.

DEV-50V

You can set the area.

Tips
- If [Auto Area ADJ] is set to [On], the area setting (date and time) will be adjusted automatically by acquiring location information from the GPS system.
- Select OFF / ON at the bottom left on the screen to set summer time.

Auto Clock ADJ (Auto clock adjustment) (DEV-50V)

This product can maintain accurate time automatically by acquiring time information from the GPS system.

▶ On
Maintains accurate time automatically.

Off
Does not maintain accurate time using the GPS system.

Notes

- You must set the date and time on this product before using this product (p. 14).
- There may be deviation of a few seconds even if [Auto Clock ADJ] is activated.
- This function automatically adjusts the clock when this product receives GPS signals and finishes triangulating successfully while the power is on. Once the clock is adjusted, it will not be adjusted until the next time you turn this product on again.
- The clock may not be adjusted to the correct time automatically using the GPS system, depending on the country/region selected for this product. In this case, set [Auto Clock ADJ] to [Off].

Auto Area ADJ (Auto area adjustment) (DEV-50V)

This product can compensate for time differences automatically by acquiring location information from the GPS system.

▶ On
Compensates for time differences automatically.

Off
Does not compensates for time differences automatically.

Notes

- You must set the date and time on this product before using this product (p. 14).
- There may be deviation of a few seconds even if [Auto Area ADJ] is activated.
- This product may not compensate for the time difference automatically, depending on the country/region selected for this product. In this case, set [Auto Area ADJ] to [Off].

Troubleshooting

If you run into any problems using this product, follow the steps below.

① Check the list (p. 65 to 73), and inspect this product.

↓

② Disconnect the power source, attach the power source again after about 1 minute, and turn this product on.

↓

③ Select MENU (MENU) → [Setup] → [General Settings] → [Initialize]. If you select [Initialize], all settings, including the clock setting, are reset.

↓

④ Contact your Sony dealer or local authorized Sony service facility if the issue is not resolved.

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- Batteries/power sources ..... p. 66
- Viewfinder ..... p. 66
- Memory card ..... p. 67
- Recording ..... p. 67
- Playback ..... p. 68
- Playing back images stored on memory card on other devices ..... p. 69
- Editing movies/photos on this product ..... p. 69
- Playback on the TV ..... p. 69
- Copying/Connecting to other devices ..... p. 69
- Connecting to a computer ..... p. 69

Overall operations

The power does not turn on.

- Attach a charged battery pack to this product (p. 12).
- The plug of the AC Adaptor has been disconnected from the wall outlet (wall socket). Connect it to the wall outlet (wall socket) (p. 12).

This product does not operate even when the power is set to on.

- It takes a few seconds for this product to be ready to shoot after the power is turned on. This is not a malfunction.
- Disconnect the AC Adaptor from the wall outlet (wall socket) or remove the battery pack, then reconnect it after about 1 minute.

The menu settings have been changed automatically.

- While Intelligent Auto is active, some menu settings related to image quality and audio quality will be changed automatically.
- The following menu items return to the default setting when you switch the photo recording mode to another mode.
  - [Self-Timer]
  - [Tele Macro]
  - [White Balance]
  - [IRIS]
  - [Shutter Speed]
  - [Low Lux]
  - [Scene Selection]
  - [Auto Back Light]

This product gets warm.

- This product may become warm during operation. This is not a malfunction.

A rattling noise can be heard when you shake this product.

- If no noise is heard when this product is turned on and is in the movie/photo recording mode, the noise is produced by the movement of the internal lens. This is not a malfunction.

Intelligent Auto is canceled.

- The Intelligent Auto setting is canceled if you change the following settings:
  – [White Balance]
  – [Exposure]
  – [Focus]
  – [IRIS]
  – [Shutter Speed]
  – [AE Shift]
  – [White Balance Shift]
  – [Low Lux]
  – [Hyper Gain]
  – [Scene Selection]
  – [Auto Wind NR]
  – [Tele Macro]
  – [SteadyShot]
  – [SteadyShot]
  – [Auto Back Light]
  – [Face Detection]

[Hyper Gain] is canceled.

- [Hyper Gain] is canceled if you change the following settings:
  – Intelligent Auto
  – [Low Lux]
- If you turn this product off and on again, [Hyper Gain] automatically returns to [Off] (the default setting).

Batteries/power sources

The power abruptly turns off.

- Use the AC Adaptor.
- Charge the battery pack (p. 12).

The CHG (charge) lamp does not light up while the battery pack is being charged.

- Turn off this product by pressing the POWER button.
- Attach the battery pack to this product correctly (p. 12).
- Connect the power cord (mains lead) to the wall outlet (wall socket) properly.
- The battery charge is completed (p. 12).

The CHG (charge) lamp flashes while the battery pack is being charged.

- If the temperature of the battery pack is too high or too low, you may not be able to charge it (p. 80).
- Attach the battery pack to this product correctly (p. 12). If the problem persists, disconnect the AC Adaptor from the wall outlet (wall socket) and contact your Sony dealer. The battery pack may be damaged.

The remaining battery time indicator does not indicate the correct time.

- The ambient temperature is too high or too low. This is not a malfunction.
- The battery pack has not been charged enough. Fully charge the battery again. If the problem persists, replace the battery pack with a new one (p. 81).
- The indicated time may not be correct depending on the environment of use.

The battery pack is quickly discharged.

- The ambient temperature is too high or low. This is not a malfunction.
- The battery pack has not been charged enough. Fully charge the battery again. If the problem persists, replace the battery pack with a new one (p. 81).

Viewfinder

Menu items are grayed out.

- You cannot select grayed items in the current recording/playback situation. Select a grayed item and check the reasons why you cannot select the item.
- There are some functions you cannot activate simultaneously.

The image in the viewfinder is not clear.

- Adjust the diopter using the right and left diopter adjustment knobs until the image appears clearly (p. 14).
- Adjust the width between the right and left viewfinder to fit your eyes (p. 15).
- Use [Viewfinder Adjust] (p. 61).

Viewing 3D movies makes you feel uncomfortable.

- Use [Auto 3D Lens Adjust] (p. 51).
- Switch the viewfinder display mode to 2D by pressing FINDER 2D/3D (p. 20).

Memory card

Operations using the memory card cannot be performed.

- If you use the memory card formatted on a computer, format it again on this product (p. 58).

Images stored on the memory card cannot be deleted.

- The maximum number of images that you can delete on the index screen at one time is 100.
- You cannot delete the protected images.

The data file name is not indicated correctly or flashes.

- The file is damaged.
- The file format is not supported by this product (p. 80).

Recording

Refer also to “Memory card” (p. 67).

Pressing START/STOP or PHOTO does not record images.

- The playback screen is displayed. Press MODE to turn on the (Movie) or (Photo) lamp (p. 21).
- This product is recording the image you have just shot on the memory card. You cannot make new recording during this period.
- The memory card is full. Delete unnecessary images (p. 32).
- Total number of movie scenes or photos exceeds the recording capacity of this product (p. 75). Delete unnecessary images (p. 32).

Photos cannot be recorded.

- You cannot record photos while recording a movie. Press MODE to switch to the photo mode (p. 22).
- When [2D/3D Mode Select] is set to [3D], you cannot record photos. Select [2D/3D Mode Select] to [2D] first (p. 56), then switch to the photo recording mode.

The access lamp remains lit or flashing even if recording was stopped.

- This product is saving the scene you have just shot on the memory card.

The imaging field looks different.

- The imaging field may look different depending on the condition of this product. This is not a malfunction.

The actual recording time for movies is less than the expected recording time of the memory card.

- Depending on the recording conditions, the time available for recording may be shorter, for example when recording a fast moving object, etc. (p. 75).

This product stops operating.

- If you keep applying vibration on this product, recording may stop.

There is a time difference between the point when START/STOP is pressed and the point that the recording movie is started or stopped actually.

- On this product, there may be a slight time delay between the point where you press START/STOP and the actual point that recording movie starts/stops. This is not a malfunction.

The auto focus does not function.

- Set [Focus] to [Auto] (p. 49).
- The recording conditions are not suitable for auto focus. Adjust the focus manually (p. 49).

SteadyShot does not function.

- Set [SteadyShot] to [Active] or [Standard] (p. 53), [SteadyShot] to [On] (p. 53).
- Even if [SteadyShot] is set to [Active] or [Standard], [SteadyShot] to [On], this product may not be able to compensate for excessive vibrations.
- You may not recognize the effect when you use the large magnification.

The subjects passing by the screen very fast appear crooked.

- This is called the focal plane phenomenon. This is not a malfunction. Because of the way the image device (CMOS sensor) reads out image signals, the subjects passing by the lens rapidly might appear crooked depending on the recording conditions.

Horizontal stripes appear on the images.

- This occurs when recording images under a fluorescent lamp, sodium lamp, or mercury lamp. This is not a malfunction.

Sound is not recorded correctly.

- If you disconnect an external microphone, etc. during recording movies, sound may not be recorded correctly.
- Connect the microphone again in the same way as when you start recording movies.

Playback

Images cannot be played back.

- Images recorded on other devices may not be played back. This is not a malfunction.
- When [2D/3D Mode Select] is set to [3D], movies recorded with 2D cannot be played back.

Photos cannot be played back.

- Photos cannot be played back if you have modified files or folders, or have edited the data on a computer. (The file name flashes in that case.) This is not a malfunction.
- You cannot play back photos when [2D/3D Mode Select] is set to [3D]. Select [2D] to play back photos (p. 56).

? is indicated on a thumbnail.

- This may appear on an image recorded on other devices, edited on a computer, etc.
- You removed the AC Adaptor or the battery pack while the memory card icon at the top right corner of the screen flashes, or before the access lamp is turned off after recording. This may damage your image data and ? is displayed.

is indicated on a thumbnail.

- The image data base file may be damaged. Check the data base file by selecting MENU (MENU) → [Setup] → [Media Settings] → [Repair Img. DB F.]. If it still appears, delete the image with (p. 32).

No sound or only a low volume sound is heard during playback.

- Turn up the volume (p. 24).
- When you record sound with [Micref Level] (p. 55) set to [Low], the recorded sound may be difficult to hear.

Playing back images stored on memory card on other devices

Images cannot be played back or the memory card is not recognized.

- The playback device does not support playing back memory cards (p. 2).

Editing movies/photos on this product

Unable to edit.

- Unable to edit because of the condition of the image.

A movie cannot be divided.

- A movie that is too short cannot be divided.
- A protected movie cannot be divided.

Playback on the TV

Neither image nor sound is played on the connected TV.

- Images are not output from the HDMI OUT jack, if copyright protection signals are recorded in the images.

The top, bottom, right, and left edges of images are trimmed slightly on a connected TV.

- The screen of this product can display recording images across the entire screen (full pixel display). However, this may cause slight trimming of the top, bottom, right, and left edges of images when played back on a TV which is not compatible with full pixel display.

The image appears distorted on the 4:3 TV.

- This happens when viewing a recorded image on a 4:3 TV. Set [TV Type] correctly (p. 59) and play back the image.

Black bands appear at the top and bottom of the screen of the 4:3 TV.

- This happens when viewing a recorded image on a 4:3 TV. This is not a malfunction.

Copying/Connecting to other devices

Images are not copied correctly.

- You cannot copy images using the HDMI cable.
- An AV Cable (sold separately) is not connected properly. Make sure to connect the cable to the input jack of another device (p. 43).

Connecting to a computer

"PlayMemories Home" cannot be installed.

- Check the computer environment or installation procedure required to install "PlayMemories Home."

"PlayMemories Home" does not work correctly.

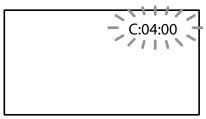
- Quit "PlayMemories Home" and restart your computer.

This product is not recognized by the computer.

- Disconnect devices from the USB jack of the computer other than the keyboard, mouse, and this product.
- Disconnect the micro USB cable from the computer and this product, and restart the computer, then connect the computer and this product again in the correct order.

Self-diagnosis display/ Warning indicators

If indicators appear on the screen, check the following.
If the problem persists even after you have tried to fix a couple of times, contact your Sony dealer or local authorized Sony service facility. In this case, when you contact them, give them all the numbers of the error code beginning with C or E.



C: (or E:) □□:□□ (Self-diagnosis display)

C:04:□□
- The battery pack is not an "InfoLITHIUM" battery pack (V series). Use an "InfoLITHIUM" battery pack (V series) (p. 80).
- Connect the DC plug of the AC Adaptor to the DC IN jack of this product securely (p. 12).

C:06:□□
- The battery pack temperature is high. Change the battery pack or place it in a cool place.

C:13:□□ / C:32:□□
- Remove the power source. Reconnect it and operate this product again.

E:□□:□□
- Follow the steps from ② on page 65.

(Battery level warning)

- The battery pack is nearly used up.
- Depending on the operating environment or battery conditions, may flash, even if there are about 20 minutes remaining.

(Warning indicator pertaining to battery pack temperature)

- The battery pack temperature is high. Change the battery pack or place it in a cool place.

HDMI (Warning indicator pertaining to HDMI output stopped by overheating)

- Because the temperature of this product has reached a level where HDMI output has stopped, no image is displayed on the connected monitor, etc. Leave this product until the temperature decreases. However, you can continue recording on this product.

(Warning indicator pertaining to memory card)

Slow flashing

- Free space for recording images is running out. For the type of memory card you can use with this product, see page 17.

Fast flashing

- There is not enough free space for recording images. After storing the images on other media (p. 39), delete unnecessary images, or format the memory card (p. 58).
- The image database file may be damaged. Check the database file by selecting MENU (MENU) → [Setup] → [Media Settings] → [Repair Img. DB F.].

(Warning indicator pertaining to memory card formatting)

- The memory card is damaged.
- The memory card is not formatted correctly (p. 58).

(Warning indicator pertaining to incompatible memory card)

- Incompatible memory card is inserted (p. 17).

(Warning indicator pertaining to the write-protect of the memory card)

- The memory card is write-protected.
- Access to the memory card was restricted on another device.

(Warning indicator pertaining to the external media device)

- The image database file may be damaged. Check the database file by selecting MENU (MENU) → [Setup] → [Media Settings] → [Repair Img. DB F.].

(Warning indicator pertaining to formatting of the external media device)

- The external media device is damaged.
- The external media device is not formatted correctly.

(Warning indicator pertaining to camera-shake warning)

- This product is not held steady, so camera-shake easily occurs. Hold this product steady with both hands and record the image. However, note that the camera-shake warning indicator does not disappear.

(Warning indicator pertaining to photo recording)

- The memory card is full.
- Photos cannot be recorded during processing. Wait for a while, then record.

Tips

- You may hear a melody when some warning indicators appear on the screen.

Description of warning messages

If messages appear on the screen, follow the instructions.

Memory card

Data error.

- An error occurred during reading or writing the memory card in this product.

- This may occur when you keep applying shock on this product.
- Movies recorded on other devices may not be played back.

Inconsistencies found in image database file. Do you want to repair the image database file?
Inconsistencies found in image database file. Cannot record or play HD movies. Do you want to repair the image database file?

- You cannot record or play back movies because no movie management information exists. If you select OK, new management information is created and you can record or play back movies.

Inconsistencies found in the image database file. Back up and recover. Recover, then import using the included PC software.

- Since the database information of high definition image quality movies has been damaged, there are inconsistencies between the information in the database and the information in the file. Select OK to back up the high definition image quality movies and repair the database file. You cannot see the backed-up movies on this product. By connecting this product to a computer after repairing the database, you can import backed-up high definition image quality movies to the computer using the "PlayMemories Home" software installed on the computer. However, it is not guaranteed that all movies can be imported to the computer.

Buffer overflow. Writing to the media was not completed in time.

- You have performed recording and erasing operations repeatedly, or a memory card that has been formatted by other device is used. Copy and take data backup to other device (such as a computer), and then format the memory card on this product (p. 58).
- The size of the inserted memory card is not sufficient for copying the movie(s). Use the recommended memory card (p. 17).

Recovering data.

- This product tries to recover data automatically if the data writing was not performed properly.

Cannot recover data.

- Writing data onto the media of this product has failed. Attempts were made to recover the data, but they were unsuccessful.

Reinsert the memory card.

- Reinsert the memory card a few times. If even then the indicator flashes, the memory card could be damaged. Try with another memory card.

Cannot recognize this memory card. Format and use again.

- Format the memory card (p. 58). Note that if you format the memory card, all the recorded movies and photos are deleted.

The maximum number of still image folders has been reached. Cannot record still images.

- You cannot create folders exceeding 999MSDCF. You cannot create or delete created folders using this product.
- Format the memory card (p. 58). Note that if you format the memory card, all the recorded movies and photos are deleted.

This memory card may not be able to record or play movies.

- Use a memory card recommended for this product (p. 17).

This memory card may not be able to record or play images correctly.

- Use a memory card recommended for this product (p. 17).

Do not eject the memory card during writing. Data may be damaged.

- Reinsert the memory card, and follow the instructions on the screen.

External media cannot execute functions.

- Check the database file by selecting MENU (MENU) → [Setup] → [Media Settings] → [Repair Img. DB F.].
- If the message still appears, reconnect the external media device, then format it. Note that if you format the external media device, all the data on the device will be deleted.
- If you cannot format the external media device, the external media device may be incompatible with this product, or damaged. Replace it with a new one.

Other

Maximum number of images already selected.

- You can select only 100 images at one time for:
  – Deleting movies/photos
  – Protecting movies/photos, or releasing the protection
  – Copying movies/photos

Recording time of movies/number of recordable photos

Expected operating time with each battery pack

Recording time

Approximate time available when you use a fully charged battery pack.

2D

(unit: minute)

Battery pack	Continuous recording time	Typical recording time
NP-FV70	185	95
NP-FV100	375	195

3D

(unit: minute)

Battery pack	Continuous recording time	Typical recording time
NP-FV70	150	80
NP-FV100	305	160

Monitoring* time

Approximate time available when you use a fully charged battery pack.

2D

(unit: minute)

Battery pack	Continuous monitoring time
NP-FV70	210
NP-FV100	415

3D

(unit: minute)

Battery pack	Continuous monitoring time
NP-FV70	190
NP-FV100	385

* In this manual, “monitor” means that the user watches or views a subject without recording.

Playing time

Approximate time available when you use a fully charged battery pack.

(unit: minute)

Battery pack	2D	3D
NP-FV70	315	270
NP-FV100	625	535

- Each operating time in the 2D mode is measured with [REC Mode] set to [Standard HQ].
- Typical recording time shows the time when you repeatedly start/stop recording, switch the MODE lamp, and zoom.
- Times measured when using this product at 25 °C (77 °F). 10 °C to 30 °C (50 °F to 86 °F) is recommended.
- The recording, monitoring, and playback time will be shorter when you use this product in low temperatures.
- The recording, monitoring, and playback time will be shorter depending on the conditions under which you use this product.
- The remaining battery indicator (p. 85) shows the expected recording and playing time.

Expected recording time of movies

Memory card

(unit: minute)

	16 GB	32 GB	64 GB
3D	75 (75)	150 (150)	305 (305)
PS	75 (75)	150 (150)	305 (305)
FX	90 (90)	180 (180)	360 (360)
FH	120 (120)	245 (245)	495 (495)
HQ	215 (165)	440 (330)	880 (665)
LP	380 (310)	770 (630)	1545 (1260)

- Each number is measured when the Sony's memory card is used.

Notes

- The recordable time and the available monitoring time may vary depending on the recording conditions and the subject, [REC Mode], and [Frame Rate] (p. 56).
- The number in ( ) is the minimum recordable time.

Tips

- You can record a maximum of 3,999 scenes for 2D and 3D movies collectively.
- The maximum continuous recordable time of a movie is as follows.
  – 2D: about 13 hours
  – 3D: about 6 hours 30 minutes
- This product uses the VBR (Variable Bit Rate) format to automatically adjust image quality to suit the recording scene. This technology causes fluctuations in the recording time of the media. Movies containing quickly moving and complex images are recorded at a higher bit-rate, and this reduces the overall recording time.

Expected number of recordable photos

Memory card

	16:9 20.4 M
16 GB	1850
32 GB	3800
64 GB	7500

- Each number is measured when the Sony's memory card is used.
- The number of recordable photos of memory card shown is for both the maximum image size of this product and the default image size. The actual number of recordable photos is displayed on the screen during recording (p. 85).
- The number of recordable photos of memory card may vary depending on the recording conditions.

Notes

- The unique pixel array of Sony's ClearVid and the image processing system of Sony's BIONZ allows still image resolution equivalent to the sizes described.

Tips

- The following list shows the bit-rate, pixels and aspect ratio of each recording mode (movie + audio, etc.).
  – 3D movie:
  Max. 28 Mbps 1,920 × 1,080 pixels/16:9
  – 2D movie:
  PS: Max. 28 Mbps 1,920 × 1,080 pixels/16:9
  FX: Max. 24 Mbps 1,920 × 1,080 pixels/16:9
  FH: Approx. 17 Mbps (average) 1,920 × 1,080 pixels/16:9
  HQ: Approx. 9 Mbps (average) 1,440 × 1,080 pixels/16:9
  LP: Approx. 5 Mbps (average) 1,440 × 1,080 pixels/16:9

- The photo recording pixels and the aspect ratio.
  – Photo recording mode:
    6,016 × 3,384 dots/16:9
    4,512 × 3,384 dots/4:3
    4,224 × 2,376 dots/16:9
    2,592 × 1,944 dots/4:3
    1,920 × 1,080 dots/16:9
    640 × 480 dots/4:3
  – Capturing a photo from a movie:
    1,920 × 1,080 dots/16:9

Using this product abroad

Power supply

You can use this product in any country/region within the AC 100 V to 240 V and 50 Hz/60 Hz range by using the AC Adaptor supplied with this product.

Viewing 3D movies

In countries/regions where 1080/60i (1080/50i) is supported, you can view 3D movies as recorded by connecting this product to a 3D compatible TV (or monitor) with the HDMI cable (supplied).

Viewing high definition image quality movies

In countries/regions where 1080/60i (1080/50i) is supported, you can view the movies with the same high definition image quality as that of the recorded movies. You need a NTSC (or PAL)-system-based and 1080/60i (1080/50i) compatible TV (or monitor) with HDMI input jacks. The HDMI cable (supplied) must be connected.

Viewing standard definition image quality movies

To view standard definition image quality movies, you need a NTSC (or PAL)-system-based TV with AUDIO/VIDEO input jacks. An AV Cable (sold separately) must be connected.

Watching the recorded movies on a TV

To watch recorded movies on a TV, record movies after selecting the appropriate [60i/50i Sel] setting for the TV color system of the country/region where you are using this product.

Countries/regions where you need to set [60i/50i Sel] to [60i (NTSC)]

Bahama Islands, Bolivia, Canada, Central America, Chile, Colombia, Ecuador, Guyana, Jamaica, Japan, Korea, Mexico, Peru, Surinam, Taiwan, the Philippines, the USA, Venezuela, etc.

Countries/regions where you need to set [60i/50i Sel] to [50i (PAL)]

Argentina, Australia, Austria, Belgium, Bulgaria, Brazil, China, Czech Republic, Denmark, Finland, France, Germany, Guiana, Holland, Hong Kong, Hungary, Iran, Iraq, Italy, Kuwait, Malaysia, Monaco, New Zealand, Norway, Paraguay, Poland, Portugal, Russia, Singapore, Slovak Republic, Spain, Sweden, Switzerland, Thailand, Ukraine, United Kingdom, Uruguay, etc.

Setting to the local time

You can easily set the clock to the local time by setting a time difference when using this product abroad. Select MENU (MENU) → [Setup] → [Clock Settings] → [Date & Time Setting] → [Summer Time] and MENU (MENU) → [Setup] → [Clock Settings] → [Area Setting] (p. 63).

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When [Auto Clock ADJ] and [Auto Area ADJ] are set to [On], the clock is set to the local time automatically by the GPS function (p. 64).

World time difference

Time-zone differences	Area setting
GMT	Lisbon/London
+01:00	Berlin/Paris
+02:00	Helsinki/Cairo/Istanbul
+03:00	Nairobi
+03:30	Tehran
+04:00	Moscow/Abu Dhabi/Baku
+04:30	Kabul
+05:00	Karachi/Islamabad
+05:30	Kolkata/New Delhi
+06:00	Almaty/Dhaka
+06:30	Yangon
+07:00	Bangkok/Jakarta
+08:00	HongKong/Singapore/Beijing
+09:00	Tokyo/Seoul
+09:30	Adelaide/Darwin
+10:00	Melbourne/Sydney
+11:00	Solomon Is
+12:00	Fiji/Wellington
–11:00	Midway Island
–10:00	Hawaii
–09:00	Alaska
–08:00	LosAngeles/Tijuana
–07:00	Denver/Arizona
–06:00	Chicago/MexicoCity
–05:00	New York/Bogota
–04:00	Santiago
–03:30	St. John's
–03:00	Brasilia/Montevideo
–02:00	Fernando de Noronha
–01:00	Azores/Cape Verde Is.

About the AVCHD format

What is the AVCHD format?

The AVCHD format is a high definition digital video camera format used to record a high definition signal using efficient data compression coding technology. The MPEG-4 AVC/H.264 format is adopted to compress video data, and the Dolby Digital or Linear PCM system is used to compress audio data.

The MPEG-4 AVC/H.264 format is capable of compressing images at higher efficiency than that of the conventional image compressing format.

The MPEG-4 MVC/H.264 format is adopted to compress 3D video data in the AVCHD format Ver. 2.0 for the 3D and 60p/50p recording.

- As the AVCHD format uses a compression coding technology, the picture may be disturbed in scenes where picture, field angles or brightness, etc. change drastically, but this is not a malfunction.

About GPS (DEV-50V)

The GPS (Global Positioning System) is a system that calculates geographical location from highly accurate US space satellites. This system allows you to pinpoint your exact location on the earth. The GPS satellites are located in 6 orbits, 20,000 km above the earth. The GPS system consists of 24 or more GPS satellites. A GPS receiver receives radio signals from the satellites, and calculates the current location of the receiver based on the orbital information (almanac data) and travel time of the signals, etc.

Determining a location is called "triangulating." A GPS receiver can determine the location's latitude and longitude by receiving signals from 3 or more satellites.

- As the positions of GPS satellites vary constantly, it may take longer to determine the location or the receiver may not be able to determine the location at all, depending on the location and time you use this product.
- "GPS" is a system for determining geographic location by triangulating radio signals from GPS satellites. Avoid using this feature in places where radio signals are blocked or reflected, such as a shadowy place surrounded by buildings or trees, etc. Use this feature in open sky environments.
- You may not be able to record location information at locations or in situations where radio signals from the GPS satellites do not reach this product as follows.
  - In tunnels, indoors or under the shade of buildings.
  - Between tall buildings or at narrow streets surrounded by buildings.
  - In underground locations, locations surrounded by dense trees, under an elevated bridge, or in locations where magnetic fields are generated, such as near high voltage cables.
  - Near devices that generate radio signals of the same frequency band as this product: near 1.5 GHz band mobile telephones, etc.
- When you upload to or share on the web images recorded with [GPS Setting] set to [On], location information may unintentionally be made known to others. If you want to avoid that situation, set [GPS Setting] to [Off] (p. 62).

On triangulating errors

- If you move to another location right after turning the power switch to ON, it may take a longer time for this product to start triangulating, compared to when you stay in the same place.
- Error caused by the position of GPS satellites
  This product automatically triangulates your current location when this product receives radio signals from 3 or more GPS satellites. The triangulating error allowed by the GPS satellites is about 10 m (33 feet). Depending on the environment of the location, the triangulating error can be greater. In this case, your actual location may not match the location on the GPS information. Meanwhile, the GPS satellites are controlled by the United States Department of Defense, and the degree of accuracy may be changed intentionally.
- Error during the triangulating process
  This product acquires location information periodically during triangulating. There is a slight time difference between when the location information is acquired and when the location information is recorded on an image, therefore, the actual recording location may not match exactly the location on the map based on the GPS information.

On the restriction of use of GPS

- Use GPS in accordance with the regulations of the situation, the countries/regions of use.

On the geographic coordinate system

- The "WGS-84" geographic coordinate system is used.

About the memory card

- A memory card formatted by a computer (Windows OS/Mac OS) does not have guaranteed compatibility with this product.
- Data read/write speed may vary depending on the combination of the memory card and memory card compliant product you use.
- Damaged or lost data may occur in the following cases (the data will not be compensated for):
  - If you eject the memory card, or turn off this product while this product is reading or writing image files on the memory card (while the access lamp is lit or flashing)
  - If you use the memory card near magnets or magnetic fields

- It is recommended that you make a back-up of important data on the hard disk of a computer.
- Do not attach a label or the like on memory card or memory card adaptor. Doing so may cause a malfunction.
- Do not touch, or allow metallic objects to come into contact with the terminals.
- Do not bend, drop or apply strong force to the memory card.
- Do not disassemble or modify the memory card.
- Do not let the memory card get wet.
- Keep the memory card out of the reach of small children. There is danger that a child might swallow it.
- Do not insert anything other than the compliant size of memory card into the memory card slot. Doing so may cause a malfunction.
- Do not use or keep the memory card in the following locations:
  – Places subject to extremely high temperature, such as a car parked outside in the summer
  – Places under direct sunlight
  – Places with extremely high humidity or subject to corrosive gases

On usable memory card

- Only "Memory Stick PRO Duo" media (half the size of standard "Memory Stick" media) or standard size SD cards are usable with this product.

On the memory card adaptor

- When using memory card with memory card compliant device inserting memory card into memory card adaptor, make sure the memory card is inserted facing in the correct direction. Note that improper use may cause a malfunction.

On image data compatibility

- Image data files recorded on memory card by this product conform to the "Design rule for Camera File system" universal standard established by the JEITA (Japan Electronics and Information Technology Industries Association).
- If you cannot use memory cards that have been used with another device, format it with this product (p. 58). Note that formatting erases all information on the memory card.
- You may not be able to play back images with this product:
  – When playing back image data modified on your computer
  – When playing back image data recorded with other devices

About the "Memory Stick" media

Types of "Memory Stick" media	Recording/Playback
"Memory Stick Duo" media (with MagicGate)	—
"Memory Stick PRO Duo" media (Mark2)	✓
"Memory Stick PRO-HG Duo" media	✓
"Memory Stick XC-HG Duo" media	✓

- This product does not support 8-bit parallel data transfer. This product performs 4-bit parallel data transfer equivalent to that of "Memory Stick PRO Duo."
- This product cannot record or play data that uses "MagicGate" technology. "MagicGate" is a copyright protection technology that records and transfers the contents in an encrypted format.

About the "InfoLITHIUM" battery pack

This product operates only with an "InfoLITHIUM" V series battery packs NP-FV70/FV100.
"InfoLITHIUM" V series battery packs have the InfoLITHIUM V mark.

What is an "InfoLITHIUM" battery pack?

- An "InfoLITHIUM" battery pack is a lithium-ion battery pack that has functions for communicating information related to

operating conditions between this product and an AC Adaptor/charger (sold separately).
- The "InfoLITHIUM" battery pack calculates the power consumption according to the operating conditions of this product, and displays the remaining battery time in minutes.

To charge the battery pack

- Be sure to charge the battery pack before you start using this product.
- We recommend charging the battery pack in an ambient temperature of from 10 °C to 30 °C (50 °F to 86 °F) until the CHG (charge) lamp turns off. If you charge the battery pack outside of this temperature range, you may not be able to charge it efficiently.

To use the battery pack effectively

- Battery pack performance decreases when the ambient temperature is 10 °C (50 °F) or below, and the length of time you can use the battery pack becomes shorter. In that case, do one of the following to use the battery pack for a longer time.
  - Put the battery pack in a pocket to warm it up, and install it on this product right before you start taking shots.
  - Use a large capacity battery pack (NP-FV100).
- Have spare battery packs ready for 2 or 3 times the expected recording time, and make trial recordings before making the actual recording.
- Do not expose the battery pack to water. The battery pack is not water resistant.

About the remaining battery time indicator

- When the power goes off even though the remaining battery time indicator indicates that the battery pack has enough power to operate, charge the battery pack fully again. Remaining battery time will be indicated correctly. Note, however, that the battery indication will not be restored if it is used in high temperatures for a long time, or if left in a fully charged state, or when the battery pack is frequently used. Use the remaining battery time indication as a rough guide only.
- The mark that indicates low battery flashes even if there are still 20 minutes of battery time remaining, depending on the operating conditions or ambient temperature.

About storage of the battery pack

- If the battery pack is not used for a long time, fully charge the battery pack and use it up on this product once a year to maintain proper function. To store the battery pack, remove it from this product and put it in a dry, cool place.
- To discharge the battery pack on this product completely, select MENU (MENU) → [Setup] → [General Settings] → [Power Save] → [Off], and leave this product in recording standby until the power goes off (p. 63).

About battery life

- Battery capacity decreases over time and through repeated use. If decreased usage time between charges becomes significant, it is probably time to replace it with a new one.
- Each battery's life is governed by storage, operating and environmental conditions.

About handling of this product

On use and care

- Do not use or store this product and accessories in the following locations:
  - Anywhere extremely hot, cold or humid. Never leave them exposed to temperatures above 60 °C (140 °F), such as under direct sunlight, near heaters or in a car parked in the sun. They may malfunction or become deformed.
  - Near strong magnetic fields or mechanical vibration. This product may malfunction.
  - Near strong radio waves or radiation. This product may not be able to record properly.
  - Near AM receivers and video equipment. Noise may occur.
  - On a sandy beach or anywhere dusty. If sand or dust gets in this product, it may result in a malfunction. Sometimes this malfunction cannot be repaired.

– Near windows or outdoors, where the viewfinder, or the lens may be exposed to direct sunlight. This damages the screen.
- For DC or AC operation, use the accessories recommended in these operating instructions.
- Do not let this product get wet, for example, from rain or sea water. If this product gets wet, it may malfunction. Sometimes this malfunction cannot be repaired.
- If any solid object or liquid gets inside the casing, unplug this product and have it checked by a Sony dealer before operating it any further.
- Avoid rough handling, disassembling, modifying, physical shock, or impact such as hammering, dropping or stepping on the product. Be particularly careful of the lens.
- Turn the power off when you are not using this product.
- Do not wrap this product with a towel, for example, and operate it. Doing so might cause heat to build up inside.
- When disconnecting the power cord (mains lead), pull it by the plug and not the cord.
- Do not damage the power cord (mains lead) such as by placing anything heavy on it.
- Do not use a deformed or damaged battery pack.
- Keep metal contacts clean.
- If the battery electrolytic liquid has leaked:
  – Consult your local authorized Sony service facility.
  – Wash off any liquid that may have contacted your skin.
  – If any liquid gets in your eyes, wash with plenty of water and consult a doctor.

When not using this product for a long time

- To keep this product in optimum state for a long time, turn it on and let it run by recording and playing back images about once a month.
- Use up the battery pack completely before storing it.

Moisture condensation

If this product is brought directly from a cold place to a warm place, moisture may condense inside this product. This may cause a malfunction to this product.

- If moisture condensation has occurred
  Leave this product for about 1 hour without turning it on.
- Note on moisture condensation
  Moisture may condense when you bring this product from a cold place into a warm place (or vice versa) or when you use this product in a humid place as follows:
  – You bring this product from a ski slope into a place warmed up by a heating device.
  – You bring this product from an air conditioned car or room into a hot place outside.
  – You use this product after a squall or a shower.
  – You use this product in a hot and humid place.
- How to prevent moisture condensation
  When you bring this product from a cold place into a warm place, put this product in a plastic bag and seal it tightly. Remove the bag when the air temperature inside the plastic bag has reached the surrounding temperature (after about 1 hour).

On handling the casing

- If the casing is soiled, clean this product body with a soft cloth lightly moistened with water, and then wipe the casing with a dry soft cloth.
- Avoid the following to avoid damage to the finish:
  – Using chemicals such as thinner, benzine, alcohol, chemical cloths, repellent, insecticide and sunscreen
  – Handling this product with above substances on your hands
  – Leaving the casing in contact with rubber or vinyl objects for a long period of time

About care and storage of the lens

- Wipe the surface of the lens clean with a soft cloth in the following instances:
  - When there are fingerprints on the lens surface
  - In hot or humid locations
  - When the lens is exposed to salty air such as at the seaside
- Store in a well-ventilated location subject to little dirt or dust.
- To prevent mold, periodically clean the lens as described above.

On handling the supplied items

If storing this product in the carrying case after getting it wet, wipe the body dry before storing it. If the carrying case and the neck strap get wet, dry them well after using before storing them.

On charging the pre-installed rechargeable battery

This product has a pre-installed rechargeable battery to retain the date, time, and other settings even when this product is turned off. The pre-installed rechargeable battery is always charged while this product is connected to the wall outlet (wall socket) via the AC Adaptor or while the battery pack is attached. The rechargeable battery will be fully discharged in about 3 months if you do not use this product at all. Use this product after charging the pre-installed rechargeable battery.

However, even if the pre-installed rechargeable battery is not charged, this product operation will not be affected as long as you are not recording the date.

How to charge the pre-installed rechargeable battery

Connect this product to a wall outlet (wall socket) using the supplied AC Adaptor, and leave it with the device turned off for more than 24 hours.

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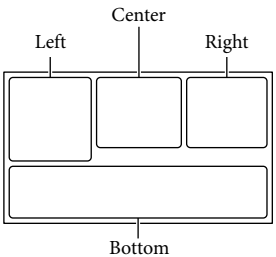
Screen indicators



Left

Indicator	Meaning
MENU	MENU button (44)
	Self-timer recording (52)
	GPS triangulating status (29)
	Face Detection (54)
	Manual focus (49)
	Scene Selection (51)
	White Balance (48)
	SteadyShot off (53)
WS	White Balance Shift (50)
	Tele Macro (52)
	Destination (63)
	Intelligent Auto (28)

Center

Indicator	Meaning
[STBY]/[REC]	Recording status (21)
	Slide show set
HDMI	Warning (70)
	Playback mode (23)

Right

Indicator	Meaning
HD 60i HQ	Frame rate (60p (50p)/ 60i (50i)) and recording mode (PS/FX/FH/HQ/ LP) (28)
60min	Remaining battery (expected recording and playing time)
16:9 20.4 M	Photo size (57)
	Recording/playback/ editing media (17)
	An external media device is connected (41)
0:00:00	Counter (hour:minute: second)
00min	Estimated recording remaining time
9999	Approximate number of recordable photos and photo size
101	Playback folder
100/112	Current playing movie or photo/Number of total recorded movies or photos
2D	2D record or playback
3D	3D record or playback

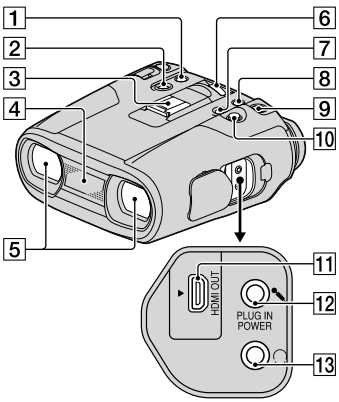
Bottom

Indicator	Meaning
	View Images button (23)
MODE	MODE (Shooting Mode) button (22)
	Micref Level low (55)
	Closer Voice off (54)
	Auto Wind NR off (54)
	Low Lux (51)
HYPER	Hyper Gain (51)
	Exposure (49)
EV	AE Shift (50)
500	Shutter Speed (50)

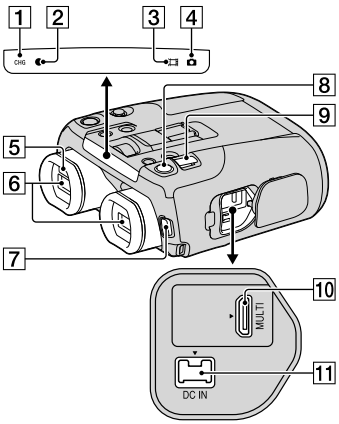
Indicator	Meaning
F1.8	IRIS (50)
iAUTO	Intelligent Auto (28)
	Slide show button
101-0005	Data file name (23)
	Protected image (33)
	3D Depth Adjustment (30)
AUTO	Automatic (31)
MANUAL	Exposure is set manually. (31)

- Indicators and their positions are approximate and may differ from what you actually see.
- Some indicators may not appear, depending on the model.

Figures in ( ) are reference pages.



1 MODE button (21)
2 POWER button (14)
3 Accessory shoe
4 Built-in microphone
5 Lens
6 IPD ADJ dial (15)
7 ▶ (View Images) button (23)
8 FINDER 2D/3D (display) button (20)
9 START/STOP button (21)
10 Multi-selector (15)
11 HDMI OUT jack (25)
12 🎤 (microphone) jack (PLUG IN POWER)
13 🎧 (headphones) jack



1 CHG (charge) lamp (12)

2 Camera recording lamp (62)
The camera recording lamp lights up in red during recording. The lamp flashes when the remaining memory card capacity or battery power is low.

3 (Movie) lamp (21)

4 (Photo) lamp (22)

5 Eye sensor

6 Viewfinder

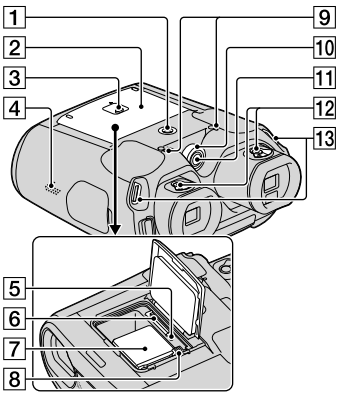
7 START/STOP button (21)

8 PHOTO button (23)

9 Power zoom lever (19)

10 Multi/Micro USB terminal (25)
Supports Micro USB compatible devices.

11 DC IN jack (12)



1 Tripod receptacle
Attach a tripod (sold separately) to the tripod receptacle using a tripod screw (sold separately: the length of the screw must be less than 5.5 mm (7/32 in.)).
Depending on the specifications of the tripod, this product may not attach in the proper direction.

2 Battery/memory card cover (12)

3 Battery/memory card cover button (12)

4 Speaker

5 Memory card access lamp (18)
While the lamp is lit or flashing, this product is reading or writing data.

6 Memory card slot (18)

7 Battery pack (12)

8 Battery release lever (13)

9 Drains (6)

10 MANUAL dial (30)

11 MANUAL button (30)

12 Diopter adjustment knobs (14)

13 Strap mount (11)

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Additional information on this product and answers to frequently asked questions can be found at our Customer Support Website.

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